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THE PETROLEUM AGE.

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THE FREE FOR ALL.

A NIGHT IN AN OIL REGION WILDCAT BOARDING HOUSE.

BY ARCH.

I SAY, boys, the joker's always trump. I'll take that pot."

"You're the luckiest dog alive. I'll be cussed ef you heven't held the joker five hands out of six all evenin'."

The first speaker was a tall, broad-shouldered fellow, whose well developed form was pretty well displayed in a dirty red woolen undershirt with one sleeve cut out at the shoulder and a pair of tight-fitting trousers of coarse material. As he called out to claim the trick he raised his brawny bare arm above his head, the muscles in it standing out under the bare skin like great cables in their cork-screw winding around his arm. Then with a swift motion he brought his hard knuckles down on the rude pine table with a loud thump, spinning the champion euchre card to the centre of the board. His broad chest heaved under the red shirt after he had spoken with a half yawn, indicating that he had enough of the game. The muscles of his great thick neck swelled a little, down near the edge of the low yoked shirt, as he suppressed the other half of the yawn and turned it into a good-humored smile, which lit up his blue eyes and rough face, and elongated his heavy brown mustache a little.

The second speaker was a short, thick-set, stupid-looking fellow, with watery white eyes, lantern jaws, and a short, round, red nose. He was dressed in shinny black clothes of an antiquated pattern, his white shirt was spotless, and his collar shone with the glossiest finish.

Besides these two there were three others who had been in the game. One of these was almost as big and brawny as the lucky holder of the joker, and dressed in much the same manner as he. The fourth member of the party was a stout little man, dressed well, but very plainly, in a neat-fitting, dark sack coat, vest and pants of the same material, the legs of the latter terminating inside of a pair of rather high-topped rubber boots. The wide collar of his blue shirt was half hidden beneath his heavy whiskers.

The last but not least among the players was a tall, thin, wiry-looking man, with piercing black eyes surmounted by straight black eyebrows. Black mustache as straight from tip to tip as his eyebrows. High cheek bones, nose with a Roman hump and a Grecian end. This man wore rather loose-fitting grey clothes that showed wear, the legs of the pantaloons being carelessly stuffed into the tops of heavy, big leather boots.

The scene was a "wildcat" boarding house in a new oil field, the sleeping department of which was termed by the boarders the "free for all." A score or so of other men, young and middle aged lounged about the room, reading, smoking, talking and laughing, most of them roughly dressed and bespattered with mud.

The first speaker, known to his comrades as Big Tim Boring, driller and contractor of oil wells, pushed his chair back from the pine table, arose, walked to the stove in the center of the room, ejected about a pint of tobacco juice on and about that useful piece of furniture, crossed over and peered out through one of the cracks between the rough hemlock boards of which the house was built. Through these wide cracks came the flickering rays of a huge natural gas light burning just outside, the flame roaring like the distant rushing of a mighty waterfall. The lurid flame which shot up 20 feet from the end of the gas pipe illuminated the roadway for many rods, and caused the tall forest trees to throw wierd black shadows athwart the fallen leaves.

When Big Tim again turned his face toward the assembled company, his late companion in the game, who was attired like himself, looked up with the query: "All right, Tim?"

"Beam going at a two-forty, Joe, steam howling, rope tight and jars clinking like glasses at a banquet of Congressmen," returned Boring.

"John'll soon be able to hide rope as fast as his boss," said one of the loungers looking at Tim.

"John is a good one now," said Boring, "good as most of 'em ever get, an' I'll lay 500 even as we four on the Mary Jane well out there ken hide more rope every 24 hours than any other crew in this neck o' woods."

"You talk big money, Tim," said he of the shining clothes, "but I'll bet you $25 Hooligan drills through more rock the next six days than you an' John do."

"Go you," said Tim.

"Yes, an' I'll make it $25 more," chimed in Joe Gripp, who was Tim's tool dresser.

"Say, Shorty," said Tim, coaxingly, "make it fifty. I'd as soon put up five tens an' Mr. Frontley, here, owner of the Mary Jane, shall be referee and stakeholder."

As Tim spoke everybody looked toward the stout, plainly dressed man in the rubber boots, who was Mr. Hunter Frontley, the well-known "wildcat" operator, always in search of new territory, who had made a dozen princely fortunes from lucky strikes, spent as many in the indefatigable search for other fields, and was the pioneer of this present development where the scene took place.

Mr. Frontley was about to assent to the proposition, but seeing some dissatisfaction portrayed on the face of the short, thick-set man, said quickly: "No; I prefer not to act, being interested in one of the wells. Better get some one else, Tim."

"Right, Frontley," said the tall, thin, wiry man. "Give the stakes to me, I'm wholly uninterested."

"Yes, give 'em to Slim Jim," chorused the assembly. "There's no better judge, an' he's safe as a bank."

The money was thereupon handed to Slim Jim, who placed it in a long, thin, flexible pocketbook and said: "As I've no shooting to do to-morrow, I'll just drop 'round with my torpedo line and measure up the holes, as a starter, and see fair play right through. Then I'll measure 'em up again in a week, and give the money to the side that has drilled the greatest distance. Now, Boardman, that is all right, is it? All satisfactory, Boring?"

The principals assented, and so the bet was made, after which "Shorty" Boardman, the landlord, retired to get off his good clothes, donned for a trip he had just made to the nearest town for supplies, another party drew up to the table to shuffle the dirty, well-worn cards, and conversation became general in the room. The favorite topics at the start related to the work being done in that field, and all the other producing districts from which the various persons present had recently come, the prospects of the future, the features of the market and so on. Gradually they lapsed to reminiscences of fortunes made and lost in producing and handling the slippery fluid, and from that to an assortment of stories touching a variety of topics, many of them not calculated for cold type.

The great gas light without burned brighter as the night grew darker. A few stragglers slipped off up stairs to bed. The maid of all work was going to and fro, between the kitchen precincts and the sitting room where the men were, carrying into the latter a variety of lunch pails, large and small, the cover of each being capped with a little tin cup, and the slip on the side of each holding a table knife, handle upward. Well filled pails they were, with tea or coffee in the lower part, and meat, bread, potatoes, butter, pie and cake in the upper portion, for the drillers and tool dressers who went out to their work at midnight were imperative in their demands for a good meal at daybreak, and the teamsters and rig builders, who went to their work just after breakfast, were apt to feel hungry by noon.

Perhaps half a score of pails had been ranged in a row along one wall of the room when three mud-bespattered men entered. Two of the new arrivals carried

heavy valises, which they soon deposited in a corner and began a general handshaking with the loungers in the room, as a guarantee that they had met most of them in other oil fields. They were evidently no novices.

The third member of the new party stood all this time with a small traveling bag in his hand, looking around at the motley company, at the row of pails along the walls, and at his muddy shoes. The expression of his face betokened no great satisfaction with either his personal condition or his surroundings. One of the men who had come in with him, having finished his handshaking and greeting, dropped into a vacant chair, elevated his boot-heels to the top of the stove, fished a little black pipe out of his pocket and proceeded, very comfortably, to fill it. The other was about to imitate his example, but as he turned his eyes fell on the gentleman standing just inside the door, holding his traveling bag in his hand and looking ruefully from the mud splashes on his clothes to the row of lunch pails, and then back at his muddy feet again.

Deeming some kind of introduction necessary to the stranger, he cleared his throat a few times, partly to collect his thoughts for the unusual ceremony and partly to attract attention, and then said: "Gentlemen, this is Mr. Newcome, a stranger who wants to see the oil country, as he told me an' Bill on the way out here. Mr. Newcome, I make you acquainted with Mr. Frontley, a well-known petroleum producer. Mr. Boring, the champion driller—being a driller myself, I know—and a good fellow. Mr. Gripp, the best of tool dressers. Mr.—Mr.—hum—Mr.—ha—"

"Slim Jim," prompted Big Tim in a stage whisper.

"Mr. Slim Jim, torpedo shooter, one of the coolest heads in the business, nerves of iron, and never fails to get the shot off at the very spot in the sand you want it."

The introductions thus far had been duly acknowledged, but the stranger was evidently rather embarrassed when the tall, thin, wiry man frankly stretched out his hand, and as he took it he muttered something about not hearing the name. His embarrassment was not lessened when the torpedo agent said "Slim Jim" very distinctly.

At this juncture Boardman entered, and being presented as the landlord, Mr. Newcome lost no time in asking if he could be accommodated with a room and bed that night.

"Well," said Boardman, slowly, "no, not exactly. You see, I'm pretty full an' the best I ken do fer you is to give you a shake down on the dining room table an' another on the floor for t'other two."

Mr. Newcome looked a little dismayed at the prospect, and Slim Jim at once offered him the use of his bed for the night, if he would like that better. After some parley and protestations on Mr. Newcome's part that the table would do for him, it was finally arranged that he should occupy Jim's bed. Supper was provided for three, and shortly after they had done Mr. Frontley conducted Mr. Newcome up the stairs by the light of a small hand lamp with a badly smoked chimney.

The gas light without threw bright rays through the chinks in the outer wall and by the time they had reached the top of the stairs Mr. Newcome could see about him well enough to distinguish two rows of beds, eight in a row, on either side of the room. He was also enabled to see that the beds contained two men each, excepting two that had but one occupant. As he stared at the numerous pairs of heavy boots and piles of clothing on the floor between the beds, and glanced about at the array of clothing hanging against the walls, he became aware that the house only contained one room up stairs.

Mr. Frontley pointed out one of the beds, which had only one occupant, as Slim Jim's usual resting place, and turned to the other himself. Newcome simply stood looking about with the air of a man who had got into the wrong pew and did not know exactly how to get to the right one, and, of course, he soon became the observed of all the lodgers who had been awakened by his entrance, and that of his immediate predecessors, Big Tim and Joe Gripp.

One of the burly forms in a bed near the stairway raised its head from the pillow, blinked awhile at Mr. Newcome, and then said gruffly: "I say, neighbor, can't yer find yer bunk?" Another head popped up in the farther end of the room and a voice came from that quarter, saying: "Lookee here, mister, we can't stand three in a bed, an' this house's been full for more'n a week."

Mr. Frontley informed the last speaker that the newcomer was to sleep in Slim Jim's place, and then whispered to the latter to make believe he felt at home and get into bed as quickly as possible.

He took the advice and turned in with all possible dispatch, while Big Tim smoothed matters by remarking that he "reckoned the stranger had a right to count the lay out if he wanted to, seein' as it was his first night in the place."

But Mr. Newcome could not sleep. The bed was hard and had a mouldy odor, and he imagined that the crazy board frame which served as a bedstead was ready to break down at any moment. And when the chorus of a score of snores, high, low, loud and long, welled up to the roof, there being no ceiling to hide the view of the rafters, sleep became an im possibility. Once he did doze a little, but a snort from one of the chorus, so loud that it seemed as if it would displace at least one shingle of the roof, brought him up with a start, and he sat up in bed. Several others also got awake, and one of these was the man who drew the line at "three in a bed." The snort was repeated and the objector, picking up one of his heavy boots, shied it into the snorter's bed. The thick, hard heel came down on that worthy's chin and he started up with a howl that awoke all the rest. He sat up. Then he saw Mr. Newcome also sitting up, and concluded that he must have thrown the boot, so he picked it up, took good aim, and sent it flying at Newcome's head. The missle fell below the mark and brought up with such force against the stranger's chest that he went back on his pillow abruptly. The obnoxious snorer was still very wroth, so he picked up one of his own boots and was about to launch it at Newcome, when that gentleman's bed-fellow leaped out on the floor, threw up his hands, and cried:

"For God's sake, Jackson, don't throw. Slim Jim has 300 pounds of nitro-glycerine under this bed, and if ye'd happen to hit a can of that we'd all go to glory together, an' there wouldn't be a piece of this house left big enough fer kindling wood."

Mr. Newcome was out of bed in a moment, almost trembling with fright. "What!" said he, "dynamite under the bed! What do you mean? That any one could be so reckless as to put 300 pounds of deadly explosive under a bed! I think I'll go down stairs."

"No, you won't," said the snorter, "you'll git back into bed an' let up on yer monkey business, er I'll knock daylight out of you. I've hed enough of this banging boots at my head."

Mr. Newcome got into bed again, but the man who had thrown the boot at Jackson got up and delivered himself of a characteristic sentiment. "Mr. Snorter," said he, "thet fellow didn't throw no boot, but I did. Some things I ken stand; some I can't. I can't stand three in a bed, nor I can't stand a big duffer saying 'kowpf' in his snore. A plain snore's all right: but d—d ef I ken stand the fancy teches. Now, Jackson, ef yer want to throw boots er fight, count me in, an' let t'other fellow alone."

"Confound it, boys, shut up and go to sleep," said Big Tim. "You've had jaw enough. If you don't want to sleep, keep quiet and give the rest of us a chance."

This sentiment was echoed by everybody but the belligerants, and they finally concluded it was the part of wisdom to concur. So quiet reigned for a little while and the chorus was resumed. Mr. Newcome had enough of the free for all wildcat boarding house, so he slipped out of bed, gathered up his clothes and was making for the stairs when Jackson woke up, jumped out on the floor in front of him and said: "Here, old fellow, don't be too soon. What hev ye stole now? I guess you'd better be searched before leaving."

"I haven't stolen anything," retorted Newcome indignantly. "I merely wanted to go down stairs."

"Well, ef yer honest ye'd better git back in bed an' stay there," growled Jackson determinedly.

Mr. Newcome went back, but as he was climbing into bed his bare foot came in contact with a tin can in such a manner that it made his flesh creep. He dropped himself into his place so hastily that the crazy bunk creaked, and his bed fellow growled out, "You'd better knock the bed down on to them cans," and then all was quiet again.

At midnight Boardman awakened them all by loud calls at the foot of the stairs. Newcome's bed fellow and about half of the other men in the room got up, dressed and went out. Then, in about an hour, a troop of others filed in, took off their clothes, which were spattered with mud all over in a way that told plainly they had been handling the sand pump on some drilling well, and went to bed. Mr. Newcome, of course, got a new bed fellow, but he was glad Jackson had gone out. Boring and Gripp had gone, and their bed was occupied by John and his tool dresser, who run the afternoon tour on the Mary Jane well.

Toward morning Mr. Newcome got a little sleep, bnt he was glad to get up at daybreak and go down stairs, though not in the least refreshed by his night's experience. He was rather inclined to take his grip and his departure at the earliest practicable moment, but when breakfast was over he walked out with Mr. Frontley to look about, at that gentleman's invitation, and before they came back to dinner they had progressed so well in mutual acquaintance that Newcome had accepted the proffer of a bed in Frontley's new office, the furniture for which had just arrived that day.

Slim Jim measured the wells according to agreement and the race was begun. At the supper table he informed Mr. Newcome that he had a well to shoot next day, so if he wished to see that interesting performance he could be on hand.

After dinner the next day he carried round six cans like those under the bed up stairs, explaining that those had been empty. Big Tim volunteered to carry two of them, Joe Gripp took two more, and Slim Jim the remaining two, while Frontley, Newcome and a couple of the loungers bore the line, reel and long tin shell.

They walked to the well. Slim Jim poured the nitro-glycerine into the shell, while Tim fastened the reel to the crank on the belt wheel shaft. The cap was adjusted, the line attached to the shell, and it was slowly lowered into the hole, Jim standing over the opening guiding the line as Tim unreeled it.

The others sat outside watching until Gripp leaped suddenly to his feet, shouted, "She's going to flow!" and started to run, closely followed by the others. The line had slackened in the shooter's hand as Gripp jumped up, and Slim Jim had braced himself back half a step from his former position. When the fleeing ones paused and looked back the shooter was still bending over the hole, his tall, thin, wiry form bent as though for a spring. The black eyes were evidently peering down the orifice, though a cloud of gas and spray oil was being projected from it into his face.

"He's going to catch it," exclaimed Gripp, and the words were barely out of his mouth when the shining tin shell with its deadly contents shot up with frightful rapidity.

The long arms closed in, the long fingers wound round the shell, and the thin, wiry form braced itself more firmly on the derrick floor. Gripp had spoken truly, he had caught the shell in its upward flight, though the slightest slip would have been certain death to him, there being enough of the powerful compound in the shell to have reduced man and derrick to fragments. He held the shell until the flow subsided, lowered it again to the bottom, dropped the "go-devil" weight and exploded it successfully in the oil rock.

Newcome was amazed at the wonderful burst of oil, sand, pebbles and all that poured in a mighty column far above the derrick top as a result, and in answer to his inquiries Gripp and Frontley assured him that shooters were some times compelled to catch shells, as any attempt to run away was worse than useless, and Slim Jim modestly admitted that it was not the first time he had done it himself.

Mr. Newcome staid for a week, saw Big Tim win his bet from Boardman, witnessed the erection of four more boarding houses, three saloons, a dance hall, five stores, and about 50 derricks. When he left for his city home he invited "the boys" to call around and see him, and assured Mr. Frontley that he never could forget his night spent in the free for all boarding house, though Mr. Frontley asserted that in any new oil field he could find its prototype.

THE production of the gas wells in the Muncie, Ind., district is from 60,000,000 to 70,000,000 cubic feet daily. Muncie is supplied with fuel and light at one dollar a month for each house irrespective of the consumption of gas.

OUR AMERICAN OIL FIELDS.

HISTORY, TECHNOLOGY, GEOLOGY, MINING, TRANSPORTATION, REFINING, STATISTICS.

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[NOTE—The greater part of this article appeared in the *Chautauquan* for February, but it has been extended by the author expressly for THE PETROLEUM AGE.]

THE existence of rock (*petra*) oil (*oleum*) or petroleum, has been known from time immemorial. Moses says: "He made me to suck honey out of the rocks, and oil out of the flinty rock" (1). Job tells us "The rock poured me out rivers of oil" (2), and Micah asks, "Will the Lord be pleased with thousands of rams, or with ten thousands of rivers of oil" (3). History records the use of bitumen, one of the forms of petroleum, as a cement for the stone buildings in Babylon; this bitumen was obtained from the fountains of Is on the Euphrates, about 120 miles distant from Babylon. Herodotus (4) 450 B. C. refers to a liquid bitumen occurring at Zante, and Plutarch (5), about 66 A. D., in "Life of Sylla," speaks of bitumen in Albania. Between these early times and the first historical record of American oil in the seventeenth century, innumerable references might be given of the occurrence of oil in its various forms in Asia, Europe and Africa.

In a letter under date of July 18, 1627, the French missionary, Joseph de la Roche D'Allion (6), makes mention of petroleum springs which he visited in what is now the oil regions of New York. The spring to which reference is especially made, is probably that known to exist until recently in the vicinity of the town of Cuba, N. Y., since on a map, published fifty years after the missionary's letter, is printed in the vicinity of Cuba, *Fontaine de bitume*. To Charlevoix (7) is probably due the first record of mineral oil in Pennsylvania; in his journal of May, 1721, he speaks, on the authority of Captain de Joncaire, of the existence of oil on the banks of a branch of the Ohio, possibly the Allegheny, "the water of which is like oil, has the taste of iron," and was used "to appease all manner of pain." Peter Kalm (8) in 1772, in his "Travels in North America," gives a map showing the location of all the known oil springs learned of during his travels. In 1789 there was published a description of the Pennsylvania oil springs (9), while in 1829 there appeared a reference to petroleum in Kentucky (10). After this there are numerous records to be found of *Seneca oil*, *naptha*, and *rock oil*, by which names petroleum up to within the past three decades was indifferently called.

The important era in the development of any discovery or natural product is when its development becomes profitable. In other words I regard the discovery of commercial petroleum to date from the day when it could be mined in affirmation of the practical Americanism, *Will it pay?* and in this sense to Col. E. L. Drake, of New Haven, Conn., is due the discovery of the crude oil of commerce. About the middle of August, 1859, Drake at the instance of Messrs. Kier and Bissell, of Pittsburg, commenced the pioneer well of the Pennsylvania oil regions. On the 28th of the same month the drill "*struck oil*" at a depth of 69½ feet, and two days later the State began her oil production at the rate of 25 barrels a day: this production up to July, 1887, amounted in the aggregate to 310,000,000 barrels of 42 gallons each.

Although the most productive oil regions in America, and in fact in the world, have been those in Pennsylvania, yet petroleum has been found in greater or less quantity generally distributed. Bitumen or petroleum or both have been found in the following States and Territories: Connecticut, New York, New Jersey, West Virginia, Ohio, Indiana, Michigan, Illinois, Kentucky, Tennessee, Missouri, Kansas, Texas, Montana, Wyoming, Dakota, Colorado, New Mexico, Utah, and California. The petroleum of the American trade, however, has been produced almost exclusively in Pennsylvania, Southwestern New York, Ohio, and California; over 98 per cent. of the total production of crude to date having come from Pennsylvania.

The first rock oil of commerce was obtained by the distillation of coal, principally cannel coal, and also of bituminous shales. As early as 1694 English patents were issued for the manufacture of "pitch, tar, and oyle out of a kind of stone." In 1781 the Earl of Dundonald (11) manufactured mineral oils on a much more extensive scale than had ever been before attempted, by the distillation of coal in coke ovens. In 1847 James Young, a Scotchman, commenced extensive investigations into the manufacture of oil by distillation from a substance called "petroleum peat," obtained from Down Holland moss. Many other instances might be cited where bituminous materials were used as a base for the manufacture of mineral oils. The discovery of Pennsylvania oil, however, in large commercial quantities in 1860, subsequent to the Drake well being drilled, resulted in almost the immediate abandonment in many localities of what had become to be known as the shale oil industry.

The character of the American petroleums as they had been gathered in many "Seneca oil springs" was well understood, however, many years prior to 1859. In 1833 the elder Prof. Sillman (12) wrote, "I have frequently distilled it in a glass retort, and the naptha which collects in the receiver is of a light straw color."

Chemically, petroleum is a hydrocarbon of an exceedingly complex character; although it frequently contains elements other than carbon and hydrogen, they may be considered accidental constituents. The average proportion of carbon is 85 per cent. and of hydrogen 15 per cent. Although the color of the crude oil is sometimes as light as standard white, the bulk of the crude of commerce is of a dark greenish brown color. In specific gravity this crude varies from 0.820 to 0.782 or 40 deg. Baume (13) to 48 deg. B. Some of the hydrocarbons are so volatile as to evaporate readily at ordinary temperatures, making it oftentimes dangerous to approach an open oil tank with an exposed light, while some oils require a temperature between 700 deg. and 800 deg. F. to evaporate them.

Geology of Petroleum.—Petroleum has been found in greater or less quantities in stratified rocks of all geological ages, although the most productive oil rocks have been the Devonian (14) strata of Western Pennsylvania.

In California, petroleum has been found in the strata of the Miocene group; these are the most recently deposited strata in which petroleum has been found in commercial quantity in America, while the

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oldest rocks, or those which stand at the other end of the geological scale, which are petroliferous, are the Trenton limestone beds; these have so far been tested in parts of Ohio, Indiana, Tennessee, and Kentucky, although they have only been commercially developed in Ohio during the past three years.

In this connection it will be of interest to note a general section showing the relationship of the oil-bearing rocks from Canada through Western New York and Pennsylvania to Western Ohio, together with the thickness of that part of the crust of the earth which contains these oil rocks. Commencing then with geologically the highest strata which outcrop in Southwestern Pennsylvania the section would be as follows:

	Rocks of the Paleozoic System.	*Feet.*
Carboniferous Age.	Upper barren coal measures	950
	Upper productive coal measures (Pittsburg coal beds at the base.)	475
	Lower barren coal measures (Sandstones at top and bottom contain a small amount of oil.)	500
	Lower productive coal measures (Sandstones at base contain a small amount of oil.)	400
	Subcarboniferous sandstones and shales (Several thin sandstones and Pithole or Berea grit contain a limited amount of oil.)	825
Devonian Age.	Venango oil and gas shales and sandstones, Catskill or old red sandstone formation (Contain the most productive oil and gas sands in Western and Southwestern Pennsylvania.)	400
	Barren oil measures	300
	Warren oil and gas shales and sandstones (Contains the oil and gas sands in Warren county.)	300
	Barren oil measures	400
	McKean oil and gas shales and sandstones (contain the oil and gas sands of Allegany county, N. Y., and Bradford, Kane, etc., Pa.)	500
	Devonian barren shales and sandstone	1,200
	Corniferous limestone (Contains oil and gas.)	200
Silurian Age,	Lower Helderberg, Salina, Niagara Clinton and Medina barren measures (Niagara limestone contains oil, but not in commercial quantity.)	700
Cambrian Age.	Hudson river sandstones, shales and slates (Generally contain no oil.)	1,000
	Trenton limestone (Great oil and gas rock in Ohio and Indiana.)	100
	Total thickness	8,250

This section is a general section within a restricted area and does not represent the total thickness which these rocks attain elsewhere; for instance, in central Pennsylvania in the Broad Top coal region. I have measured these same strata where their aggregate vertical thickness was nearly four miles.

Wherever rocks have been found to contain oil in commercial quantity they are porous and lie in a comparatively horizontal position, seldom having a dip of over 75 feet to the mile: in the Bradford district, in Northern Pennsylvania, the maximum dip I have found to be only 14 feet per mile. The Pennsylvania oil is all contained in porous sandstones which are overlaid by strata impervious to oil or water. These strata range from 400 to 2,200 feet thick, that is the oil wells are seldom less than 400 or more than 2,200 feet deep.

Ample facts have been gathered to prove that petroleum is a product of a slow destructive distillation of organic remains, both animal and vegetable, which were buried in the sediment at the time that the rock-making materials were deposited in water basins. The sand and limestone beds in which the oil is now found, contained some of the organic remains from which the oil has been formed, but I believe that the bulk of the oil has come from the organic remains buried in associated strata and the porous beds in which the oil is found act merely as reservoirs to hold the oil.

These porous beds are found to exist in restricted areas: this fact gave rise to the areas in which oil is found being designated as pools. In the Allegheny river region these pools are very small and numerous, consequently the risk of getting "dry holes," or unproductive wells, is so great that out of every 100 wells drilled only about 72 wells have been found to produce oil in commercial quantity. In the Northern Pennsylvania region, or what is generally known as the Bradford District, the oil pools are very large and as a result out of every 100 wells drilled 97 have been profitably productive.

The character of the sand as well as the size of the pools has a great deal to do with the risk of getting good wells. In the Allegheny river region the sand is coarse and of very irregular character and porosity, not only in its vertical range but in its horizontal extension, while in the Bradford District the sand is much finer but of a more homogenous character and more evenly porous both vertically and horizontally.

Petroleum Mining.—Petroleum has been mined in America exclusively by artesian wells. In Japan the practice, even up to the present time, has been to dig vertical shafts from four to six feet wide and to depths as great as 1,000 feet.

Formerly the operation of drilling a well was very slow and very expensive, now an oil well can be drilled 2,000 feet at one-tenth the cost and in less than one-tenth of the time that was required when the Pennsylvania oil regions were first explored. The modern system, in its general method, is practically the same as the ancient Chinese system described by Huc (15), with the exception that steam power is used instead of manual power, which was transmitted through springing boards. Of course the special design and form of the present drilling tools are modern inventions.

The present American practice may be briefly described as follows: Over the point where the well is to be drilled a derrick is erected from 72 to 84 feet high, forming a square at the base 20 feet on the sides and verging toward the top to a square having an inside dimension along the sides of 2 feet 10 inches. On the top of the derrick is placed a crown pulley over which the cable or drill rope plays, the end of the rope inside the derrick is attached to a string of tools which measures from 55 to 70 feet in length and which weighs from 1,900 pounds to 3,400 pounds, the height of the derrick depending upon the length of the string of tools, and the length of the string of tools depending upon the size and depth of the well and the character of the strata drilled through. The other end of the rope is attatched to a horizontal shaft upon which it is wound and unwound at will, the power being supplied by a 15 to 25 horse power engine, through a leather belt which passes over a large wheel called the "bull" wheel, which itself is attached to the end of the horizontal shaft. Directly over the hole to be drilled is placed the walking-beam, which is generally 26 feet in length and which rests near the center on a heavy post 13 feet high, known as the "sampson" post. Prior to the drilling process the tools are lowered into the upper part of the hole which has been dug out, and the rope to which the tools are attached is made fast to one end of the walking-beam. The walking-beam is operated the same as a similar beam on the common side-wheel river steamboats; this beam successively raises and drops the tools which pound the rock into fine fragments. When five feet depth of rock has been pounded up in this way the tools are raised out of the hole and the broken debris is taken out of the hole by a bailer or sand-pump, which generally consists of a wrought iron tube about 20 feet long. When the sand-pump is suspended it is closed at the bottom by a foot valve, and when it rests on the bottom of the hole the valve is opened.

The cost of drilling wells depends upon many varying circumstances; in some places in Ohio and Indiana wells have been drilled 1,000 feet deep for $1,000; in an adjoining State I know of a well which has been recently completed to the depth of 2,500 feet and has cost $15,000. These figures might represent the maximum and minimum cost. In the Pennsylvania oil regions the cost of drilling a well 2,000 feet deep varies under ordinary circumstances from $3,000 to $3,500.

The depth of wells depends upon the relative position of the surface of the ground to the oil and gas rock. The average depth of the Pennsylvania wells up to 1876 was about 900 feet: since that date the Bradford sand in McKean county and the Washington sand in Washington county have been explored at considerable depths, so that the average depth of the Pennsylvania wells which have been drilled since 1876 would probably be not far from 1,600 feet.

The deepest well which has been drilled on the American continent is the Dilworth exploration well, belonging to Mr. George Westinghouse, Jr., situated in the eastern part of Pittsburg, its depth being 4,618 feet.

In the early days of petroleum and natural gas mining, wells were located by spiritualists, witch-hazelists, and quacks, or upon various theories invented by practical but superstitious men. Latterly, however, the leading oil and gas operators have realized that the occurrence of both of these minerals depends upon well-known geological conditions. It is now perfectly possible for geological experts to define territories where neither oil nor gas can possibly be obtained, and to define other territories where the conditions are favorable for its existence, and to locate wells in the latter areas where the chances for obtaining the sought for deposits are the best.

Petroleum Transportation.—When the mining of petroleum in Pennsylvania was commenced in 1859, the oil was placed in barrels at the wells and transported by wagons either to the refineries, to river flats for shipment by water, or to the railroads where barrels were loaded on cars, the oil being collected at the well in the tank. The next step was to conduct the oil through pipes from the well tanks into large storage tanks situated on the line of the railroads. The shipment of the oil in barrels was found to be expensive, for various reasons, the principal of which was the loss due to the water contained in the oil dissolving the glue and causing the barrels to leak; it is estimated that as much as one per cent. of the oil was lost in this way. The

next step was to build two wooden tanks shaped like tubs and placed on a flat railroad car, each tank holding about 2,000 gallons. In 1871 the wooden tank car gave place to the boiler iron cylinder cars which are used to some extent up to the present time. These tanks are made out of 5-16 inch wrought iron and vary in capacity from 3,800 to 5,000 gallons. Latterly, however, the transportation of crude oil in tank cars has been replaced almost entirely by pipe lines. These pipe lines are made of wrought iron pipes varying in diameter from four to eight inches. There are now pipe lines from the Pennsylvania oil regions to Pittsburg, Cleveland, Buffalo, and New York, and to the Delaware river below Philadelphia. The present practice is to store the oil in large iron tanks in the vicinity of the wells, and to convey it thence by pipe lines, either by gravity, where the slope of the ground will permit of it, or by pumping it through the pipe. The average sized storage tank holds about 30,000 barrels of crude oil.

Petroleum Refining.—The preparation of refined oil products from petroleum, for industrial uses, depends largely upon the composition of the crude oil. The following table will give the approximate composition of the oils which are most frequently spoken of in the general literature on the subject:

	Light Oils	Burning Oils	Residuum.
Pennsylvania	15	70	7
Russia	7	40	50
Galacia	5	55	35
Roumania	4	62	30
Alsace	—	37	57

All crude oils are subjected to a process of refining in order to separate from that portion designed for lamps certain products which have been classified by Dr. Chas. F. Chandler as follows: First, the lighter oils which are inflammable, and which evaporate at ordinary temperatures, and which form with proper proportions of air explosive mixtures. Second, the heavy oils which form excellent lubricators but do not burn well in lamps. From these heavy products are obtained the paraffines which are used so extensively in the arts for candles, water proofing, etc. Third, the tarry material which crusts the wicks of lamps. Fourth, the compounds which cause offensive odors.

The crude oil as it comes from the wells is subjected first to a process of distillation in large iron stills. The most volatile products of the oil pass off first in the form of vapor, which condenses by passing through coils of iron pipe surrounded by cold water; from these pipes are collected the naptha, benzine and other products. After these lighter products come from the still, the burning oil or kerosene next passes off; this illuminating oil is subsequently followed by the heavier lubricating oils containing paraffine; there remains in the iron still, finally, a small residuum composed principally of tar and coke. The special distillate known as kerosene, which is designed for illuminating oil, is then subjected to the action of sulphuric acid, which removes the odor and color which it possesses and also destroys the smell of the small amount of tar which it sometimes contains. The oil is then treated with caustic soda in order to neutralize the last traces of the acid; it is then frequently subjected to a higher temperature in order expel a small percentage of benzine which it often contains, the removal of which makes the kerosene a safer illuminant. Thus prepared it is known as the kerosene oil of commerce.

The details of the process of refining vary, not only on account of the composition of the crude oil which is treated, but also from the character of the special product which it is desired to manufacture. Although the ordinary kerosene oil of commerce is the principal product which is manufactured out of petroleum, yet the multitude of similar products which are used in the industrial arts require that the details of the general process of refining shall be modified to meet special wants of the consumer.

Statistics of Petroleum.—It is impossible to give here detailed statistics of the petroleum industry. Some general figures recently compiled by an Oil City paper will, no doubt, be sufficient to convey a general idea of the great importance of the United States oil industry up to the present time.

There have been drilled in Pennsylvania and New York since 1859 about 75,000 wells, at a cost of at least $200,000,000. These wells, up to the first of July, 1887, produced in the aggregate over 310,000,000 barrels of oil, which sold at the wells for $500,000,000, representing a profit to the producer of $300,000,000.

In the Washington county pool, which is the last large pool developed in Pennsylvania, it is estimated that there have been spent for machinery and drilling $3,200,000. There have been exported to foreign countries 6,231,103,000 gallons of refined oil, which went to the most remote parts of the world. General Grant, during his trip around the world, said that he encountered Arabs carrying American refined kerosene in cans on the backs of camels across the sterile plains.

Mr. I. H. Dean, an extensive oil operator, in a recent speech, gave figures relating to the capital invested in the tools and appliances necessary to drill and operate 75,000 oil wells. He says: "As showing the vast importance of petroleum to the world of commerce, I desire to refer to the outlay of capital that would be required for pipe, lumber and machinery in drilling 75,000 wells. The amount of two inch tubing and pipe required, figuring the wells at an average depth of 1,300 feet, and that it would take as much pipe for steam, gas and surface oil pipes as it would to put in the wells, would be 195,000,000 feet, or over 34,000 miles, enough to span the earth one and one-third times, and would cost at 15 cents per foot $29,250,000. It would require, allowing 420 feet to the well, 31,500,000 feet of 5⅝ casing, which, at 50 cents per foot, would amount to $15,750,000. Allowing an average of 100 feet of drive pipe to the well, it would require 7,500,000 feet and cost, at $1.40 per foot, $10,500,000. It would take $7,000,000 worth of lumber to build the rigs, and the machinery and boilers necessary would cost $20,000,000, making a grand aggregate of $82,500,000. When you contemplate carefully these figures, then, and not till then, you will commence to realize the vast amount of labor and capital necessary to bring to the surface and distribute this vast wealth. The story of oil reads like a tale from the 'Arabian Nights.'"

Adding to the above the cost of drilling it would make the cost of these wells at least $200,000,000. This does not in any sense represent the total capital which has been placed in the oil industry, since it does not include the capital placed in oil lands, in pipe lines and refineries.

A few general facts connected with the production and consumption of the New York, Pennsylvania and Ohio fields for 1887 will be of interest in this connection. In 1887 there were produced 22,728,396 barrels of crude oil, making a daily average of 62,270 barrels of oil as against a daily average for 1886 of 71,620 barrels. About one-third of this oil was produced by the Bradford field, in McKean county, Pennsylvania, the next largest one field being that of Washington county, Pennsylvania, which produced about one-eighth of the entire production. The daily average production of the entire field for 1884 was 64,668 barrels, and for 1885, 59,384 barrels. The total decline in stocks during the past year has been 5,010,824 barrels, the daily consumption exceeding the daily production by 12,246 barrels. The average price of crude oil for the year was 66⅝c, the highest price it attained being 90¼c, and the lowest 54½c.

The present average production of the American oil fields may be gathered from the following facts: For the month of October, 1887, there were delivered to the pipe lines, on an average per day, 61,834 barrels of crude oil from the Pennsylvania and New York fields, 660 barrels of crude oil from the Macksburg, Ohio, field, and 13,708 barrels of crude oil from the Lima, Ohio, field. In the oil fields of Southern California there have been produced since 1879, when active developments first commenced, 1,039,000 barrels of crude oil; the total production in California for 1886 being 260,000 barrels.

NOTES.

(1)—Deut.: xxxii, 13.

(2)—Job: xxxix, 6.

(3)—Micah: vi, 7.

(4)—Lib.: iv, 195.

(5)—Quoted in Bul. de la Soc. Chim. de Paris.

(6)—"Joseph de la Roche D'Allion," rosh dal-yong. "The reference is taken from Sagard, '*Historie du Canada.*'"

(7)—"Charlevoix," Pierre Francois Xavier, char-le-vwa. (1682–1761) A French Jesuit and author.

(8)—"Peter Kalm." (1715–1779) A Swedish naturalist who spent about three years in North America. After his return he published a book entitled "A Voyage to North America," in which he gave a full acount of his researches.

(9)—Such articles appeared in the *Massachusetts Magazine*, I., 416; and in the *American Chemist*, III., 174.

(10)—This article was published in the *Nites Register*, XII., 117.

(11)—"Earl of Dundonald." Archibald Cochrane. (1749–1831) A British chemist.

(12)—"Professor Silliman." Benjamin. (1779–1864.) A distinguished American naturalist: the founder and sole editor for twenty years of "The American Journal of Science and Arts." He published several scientific works, and was one of the few men who could hold a large audience through a lecture on science. For a number of years he held the chair of chemistry in Yale College.

(13)—"Baume," Antoine, bo-ma. (1728–1804.) A French chemist, the inventor of the hydrometer, an instrument for determining the specific gravity of liquids, which is called after his name.

(14)—"Devonian." Beginning with the lowest strata of rocks the science of geol-

ogoly recognizes five ages or periods of formation, the Silurian, Devonian, Carboniferous, Reptilian, and Mammalian. The Miocene group of rocks is found in the lower period of the Mammalian age, and the Trenton limestone beds belong to the lower rocks of the Silurian age.

(15)—"Huc," Evariste Regis, Abbe. (1813–1860.) A French Catholic missionary, author of a very curious and amusing book, "Travels in Tartary, Thibet, and China."

Listing Oil on the Stock Exchange.

The listing of oil on the New York Stock Exchange has been an interesting topic in the oil country for some time. Members of the Western Exchanges, not being much agitated by field news by reason of the shut-down movement must have something to talk about on dull days. A good bit of their attention is, of course, devoted to the P. P. A. but this listing of certificates in the big Stock Exchange is a fresh topic and of prime interest. Producers, who are not drilling, cannot occupy all of their time selling credit balances and they, too, take a turn at discussing the probable results of listing their product on the big Stock Board. The matter does not end even with them but is a theme of interest with the drillers and tool dressers.

There is little doubt but that the admission of petroleum certificates to the unlisted securities department will permit Wall street to get more interested in oil speculation than it has been. There is no longer much speculation on this score. But there is much discussion of the effect such listing will have on the speculative oil business and there are infinite shades of opinion on the subject. Good bulls are convinced that it means the investment of more money in the business and higher prices for the goods. Radical bears are just as certain in expression that it means powerful additions to their ranks and lower prices for all time to come as they declare the big Wall street millionaires will "sell the life out of oil."

Some of the people who argue the question do not take any facts in consideration. They have made up their minds and that is the end of it so far as they are concerned. The first fact in the case is that the effect cannot positively be known until some time after the listing. A few years ago oil was listed on the New York Mining Exchange and the same question was agitated at that time in much the same way as it is now, with the exception that a large majority of people in the oil country were of the opinion that it would bring higher prices. That was a mistaken opinion. The New Yorkers did "sell the life out of oil." But it cannot be predicated from this that listing on the Stock Exchange will result in the same thing. It is necessary to take a broader view.

At the time referred to above, oil country speculators were nearly all interested in production and naturally bulls. They thought the addition of the Mining Exchange was simply more capital to carry the stocks. But the New Yorkers were not influenced by any desire to see the producing industry prospering. They looked simply at the cold facts, concluded there was too much oil paying a high rate of storage and sold it for a fall. Then they continued selling it for the freight. It is reasonable to assume that the Stock Exchange, still farther removed from the producer, will be still colder and more matter of fact in its speculation. This does not necessarily mean more selling for the freight. It means that the Stock Exchange people will buy, or sell solely on the merits of the situation as it sees it. There is no sentiment in that speculative center against selling short to the detriment of the producer, and the present rate of freight is too small to have any weight with the "high rollers" when they see improvement in the condition of the business.

They will be bulls on declining production and stocks, bears on increasing production and surplus. They will not change much from one day to another, but will be governed by more stable conditions if they forget not their principles of stock speculation, and the producers will have the matter largely in their own hands to make them bulls or bears. At this juncture it looks as though the producer could conscientiously welcome the Stock Exchange in and encourage it to stay in by giving it full and accurate information regarding all branches of the business.

Drilling in Butler.

Butler is perhaps the best drilled county in the oil country. It has been prolific in its yield of oil from the old belt from Parker to St. Joe, on the old Karns City cross belt and in the gusher pools of Baldridge, Thorn Creek, Reibold and Saxonburg. The temptation has always been great to wildcat in Butler, though the sands lie deep, for the reward in so many instances has been great. But the time is not far off when old Butler will have to be abandoned by the energetic driller because her territory will have been explored so thoroughly that even a little gusher pool may not be hidden between the prying holes drilled in her fields and woodlands. There are some people now drilling in Butler, wildcat wells, lured by the tempting bait to violate the public conscience, and land holders encourage them in their mad dreams, unmindful of the fact that a large portion of the millions of barrels of golden oil drawn from beneath the "soap mine" county has been sold below the average cost of production, all fields considered.

A New Oil Burner.

The Salamanca *Republican* has been investigating a new patent oil burner and says of it: For some time past, C. A. Harris, of Killbuck, has been engaged in perfecting an apparatus for the use of petroleum oil for heating purposes. Various inventions of this character have been patented, but so far as we know, none of them have proved entirely satisfactory when put to a practical test.

Mr. Harris gets perfect combustion, and is able to regulate absolutely the supply of oil and consequent heat. By his method there is no more danger in using oil for fuel than there is in using it for light in a student lamp. It is impossible to deliver more oil in the stove than can be consumed and there is no smoking of pots and kettles, as has been the case with other inventions of this character. Every provision has been made for safety in using, as well as to secure combustion. The apparatus can be adapted for use in any kind of stove at small cost. Six cents' worth of crude petroleum will run a stove full blast for 24 hours, and will require but little more attention than a natural gas fire.

Imported Draft Horses.

Among those in the oil country who have devoted money, time and care to the improvement of the stock in this section are Garfield & Hazelton, of Bradford. They have not herds of fine imported Jersey cows like George V. Forman and Miller & Sibley, but have turned their attention to the improvement of heavy draft horses with decided success. They have, at this time, several imported animals of great size and weight and good spirit. A Jamestown breeder speaks of some of them in the *Journal* of that city in the following strain:

Two of Mr. Hazelton's fine teams were in waiting and conveyed the guests to the St. James hotel, where all partook of a first class dinner, after which the magnificent horses were examined. After all that had been said in favor of them, everyone expressed surprise to find them even better than they anticipated. The first to appear was the fine mahogany bay horse which was driven by Mr. Garfield. This horse is Canadian and Clyde, weighs about 1,600 pounds, has good action, fine carriage, heavy mane and tail, wide, flat, clean limbs, good feet and is just the horse for those who prefer a horse of medium weight.

The next, Capt. Curtis, is an imported Clyde. His grandsire, Daarmwell, and his dame's sire, Farmer, were of the most noted prize winners of Scotland. He is 4 years old, weighs 1,800, is bright bay in color, has very heavy bone and long, silken, mane-shaped hair on the back of his fetlocks, which is considered an indication of purity of blood in this breed of horses. He is a fast trotter for a large horse and, in fact, it would take a good horse of any kind to pass him. He has good feet and a remarkably pleasant and docile look, and is what horsemen generally term "level headed." In fact, they all seemed to be very gentle and easily managed.

The last one, Sir Herbert, called forth exclamations of surprise from all. He is an imported Clyde, weighs 2,100, is seventeen hands high, a dark brown in color with fine glossy coat, good sound feet, limbs as clean as a carriage horse, neck long and arched well up, yet powerful and well set on, short back and long hip, combining the style and beauty of the carriage horse and the strength and power of the draft horse; just the horse to make everyone exclaim, "What a handsome horse." Too much credit cannot be given Garfield & Hazelton for the steps taken toward the improvement of the horses in this section, as they have spared no pains or money to secure the best that could be found, and the farmers and friends will reap more benefit eventually than the importers.

A Woman's Ingenuity.

The chemist of the Alpha Oil Company of Port Sarnia, Ontario, is a young lady, an adopted daughter of Mr. Hall, whose process of refining is in use in the establishment. She is very skillful in her profession, and recently succeeded in analyzing the oils treated at the works, by means of the spark from a Bunsen battery, in an apparatus of her own design. She accomplished the separation of the carbons into grains while collecting the gases in separate chambers. The simplicity of the whole apparatus is only equaled by its efficiency.

F. W. Minshall, the well known geologist of Marietta, O., is drilling two wells on Fifteen, near that town, for gas.

CARMI'S BOOM.

IT WAS BRIEF, VERY BRIEF, BUT LIVELY WHILE IT LASTED.

ONLY those who have started by rail, on horseback, or afoot, in the middle of the night, in pursuit of the light-footed lie, fleeing like a shadow before the touch of investigation, can appreciate the feelings of those oil men who rushed post-haste to Carmi, Ill., a short time ago, and came madly back again. But a great many people in the oil country have experienced the wild longing to clutch the throat of the villain who lies awake o' nights hatching fictions in which the principal parts are played by imaginary flowing wells in unheard of localities, and these will fully understand the following Carmi correspondence of the Chicago *Herald:*

Mythical McLaughlin, who, when in Chicago, told several newspaper men that he had struck an eighty-barrel an hour oil well on the Harris farm, fourteen miles south of Carmi, not only knocked the props from under the eastern oil market, but started an exodus for this country, which from present appearances threatens to break the roads in all directions. McLaughlin's story was printed in the newspapers Friday morning. On Saturday night speculators, prospectors, well-shooters, drillers, riggers, casers and fishers began falling over each other in their haste to get into town. They came from the oil districts of Ohio, Pennsylvania and New York, and in their haste many of them had scarcely taken time to dress themselves.

Sunday was a critical day in the history of Carmi. Nobody here knew what was up, but from daybreak until nightfall men with an oleaginous air and a wild eye were hopping into all sorts of conveyances and driving like mad to the southward. About sundown it was given out at the hotel that oil had been struck on the Harris farm and that the invaders had come to gobble up all the land within and without the corporate limits of Carmi. The night watchman and the town whittler now remembered of having smelled oil in the air within the last decade or more and the hotel keeper got so worked up over the matter that he put a lot "o' licker" and water on the tobacco stained salamander and served a steaming beverage in tea cups. Things were getting to a white heat Sunday night, when a broad-shouldered Oil City speculator returned to town from the Harris farm. He came directly to the hotel. There was nothing particularly inviting about the man's solemnity. He was covered with mud from his high-heeled boots to the nape of his neck, and he fed on the remnants of a mustache. The loungers in the place, now merry from the catch-as-catch-can effect of Egyptian whisky, waited for the stranger to poke up the bonfire of exultation, but the stranger wouldn't poke. He paced up and down the little office for ten minutes or more. Then his reverie was shattered by the tintinnabulation of clinking cups.

"Reg'lar thing, landlord?" he asked with a half developed smile.

"Only on special occasions," replied the innkeeper. "Won't you jine us, friend?"

The drinks went round again. Then the subject of oil was resumed. The stranger pulled off his boots and threw his blue-stockinged feet before the open door of the stove.

"Now," said he, "when did you fellows first hear of this well?"

"'Bout three hours ago," one of the loungers replied.

"Well," continued the stranger with a smile, "you're all off—away off. I came away from Oil City so fast that my collars were hanging out of my grip. I was the first one back and I'll tell you now, boys, there's no more oil on Harris' farm than there is on the hinges of sheol."

Conviviality vanished with this declaration. One by one the lounggers were convinced that the McLaughlin yarn was a fake, and one by one they fled out of the office, leaving the liquor to sing on the stove and the landlord and the stranger to discuss the personal appearance and labors of Joe Mulhatton. While they were talking a Titusville rigger burst into the door and with a horned oath wanted to know how soon he could get a train for the east. When the rigger saw the Oil City man he exclaimed:

"Sucker, too, eh?"

"Yep," replied the speculator.

"Same here, too. Let's drink."

Three cups of punch disappeared in an instant, and then the ghost story about Harris' gusher was discussed again and again. It was finally agreed all 'round that Mulhatton, peripatetic Ananias, was father of the fake.

Ever since Sunday oil men have been coming and going from the Harris farm. His estate has been trampled over from one end to the other, mud has been tracked into the house and in some places the fences have been torn down. Every few hours the poor old granger has to chase a prospector off his land. The nuisance has now become so great that Harris sits in his kitchen, which overlooks the farm, with a shotgun across his knee.

The first visitor to the farm had this interview with him:

"I hear you have struck oil, Mr. Harris." "Struck what?" "Oil." "I reckon not." "The papers say that a firm has tapped your farm and got a gusher." "That might be, but I don't know what you mean." "Where are you storing it?" "Storin' what?" "The oil the men struck." "What's to hinder 'em taking it away with 'em?"

The visitor nearly fell out of the doorway. Investigation showed that there was no oil well on the farm, or in the neighborhood, for that matter. The whole matter seems to be a fake, and there is a suspicion that it was started by shrewd speculators. The suckers are still coming and going, but Farmer Harris has just begun to get his "dander up."

CORRY is of the opinion that it has been paying too high a price for its fuel gas. Accordingly about twenty of the leading business men of the place have formed themselves into a company, secured leases of land and are drilling the first test well northeast from the town and about three miles distant.

THE latest big bear story is of an oil strike in New Zealand. The well is reported to have flowed away over the derrick, caught fire and burned the rig. The fire was extinguished by putting "wet blankets over the mouth of the pipes." In old Pennsylvania a flowing well of that kind is pretty hard to conquer with wet blankets.

Crude Oil Gas for Fuel.

The latest result of the active brain of the inventor, F. G. Lilly, is the new oil-gas burner. It has only lately been perfected and Tuesday it was seen in operation. Mr. Lilly stood by and explained the workings of the new apparatus. It consists of a retort placed in the stove or fire box where it is to be used, and from this extends perpendicularly a tube, and from this projects at right angles four other pipes. On the upper side of each of these four pipes is a small hole for the escape of the gas which is generated in the retort. Crude oil is the fuel used and the gravity system is employed to force the oil into the retort from the reservoir outside the stove, and a throttle outside the stove is placed in the pipe which conveys the oil from the reservoir to the retort. This gauges the supply the same as where gas is used for fuel. The fire is started from underneath the retort and the oil is allowed to pass into this by means of the throttle; the heat from below soon causing the oil to evolve into gas which immediately ignites at the four jets before spoken of and a white, smooth gas flame is produced as when using the natural gas. It is regulated in the same manner.

The retort used on the trial Tuesday was five inches in diameter. This is the size used for heating large furnaces or boilers. Six gallons of oil will fire a 10-horse power boiler ten hours. This burner can be produced for $5, independent of the pipings. For heating or cooking purposes a burner can be produced for $2.50 and it will cost between two and three cents to maintain a steady pressure of gas for 24 hours. Mr. Lilly made a small stove expressly for the trial and the burner was in operation for two days on one of the cars of the Jamestown street railway with satisfactory results.

A patent was applied for on the 25th of October, 1887. Mr. Lilly has labored assiduously for the perfection of this burner for more than one year. As partners associated with him for the purpose of manufacturing and introducing to the public this new invention there are Frank Pennock, Lee Pennock, of this city, and Dr. Martin, of Busti, N. Y. It is the intention of the firm to start a manufactory of these burners in this city in a short time.—*Jamestown Journal.*

THE *Oil, Paint and Drug Reporter*, referring to the oil cases before the inter-State commission, says tank car transportation is much cheaper for the railroads than oil in barrels, and as an item in this cheapness says: "A further advantage is that the railways are enabled to secure profitable return freight for the empty tank cars, while the other cars have to be returned empty." What this "profitable return freight" is the *O., P. & D. R.* neglects to state, but a good deal of personal observation on this subject leads us to the conclusion that it is "wind," except where the oil transported is Lima product, in which case the "profitable return freight" is generally a combination of villainous smells. On the other hand, the same cars are used to haul oil in barrels, coke, cattle and other freight.

THE regulation of trusts may well command the gravest attention of Congress. Born to crush competition they are certain to become a commercial terror unless supervised as rigidly as the sale of whisky.

OPERATIONS IN JANUARY.

Wells Completed, Wells Drilling and Rigs Up and Building in the Entire Region.

THE tale told by operations in the fields of the Pennsylvania and New York oil regions during the month of January is one of increased and increasing confidence in the beneficent effects of the shut-down and shut-in movement. It is a story of encouragement to the men who bravely made a sacrifice for the common weal that the great surplus stocks might be reduced. There are yet some who stand out against public sentiment, who want to profit by the efforts of others to improve the condition of the business. But the humane spirit of the movement which recognized the right of the worker to share in its profits is now the tower of strength in the whole structure. The intelligent workingmen of this oil country refuse to help the mercenary wretches who would, for a few paltry dollars, plunge the whole region back in the slough of despond from which it is slowly emerging, and the weight of which is still dragging at its feet.

Throughout the region only 68 wells were completed during the month, having an aggregate production on the last day of the period of 1,000 barrels. This is the smallest completed list since the Bradford field first began to attract attention to its vast brown sand reservoirs, yet it left under way the smallest list of operations known since statistics of this character have been regularly compiled, namely 113, of which 42 were new rigs built or building at the close of the month, and 71 were wells drilling in the various stages of progress from spudding to crushing oil sand rock. The shut-down of 1884 and the accompanying depression resultant upon the panic of that year reduced the total of operations to 118 at the end of five months of persistent endeavor. The Producers' Protective Association and the Well Drillers' Union in three months have reduced the total to 113 during a time of general commercial prosperity. The low ebb of 1884 was in November with the market vibrating between 67⅝c. and 79¾c. The market during January fluctuated between 85c. and 98c.

The features of the field during January were the Schlegel & Lentz well at Reibold, the Normal School well at Clarion, the Manufacturers' Gas Company's well at Cannonsburg, the Burchfield wildcat between Saxonburg and Great Belt and the Jennings, Roth & Co. well on the Mashy farm at Brush Creek. The first to disturb the trade was the Normal School well at Clarion, which was drilled by the trustees of that school for gas to supply the school buildings, but unexpectedly struck oil instead on the 5th of January. It flowed on the ground at first and created much excitement but when turned in the tank and drilled in it only made about 30 barrels and a correspondent on the ground rates it at 16 barrels at the close of the month.

The Schlegel & Lentz well on the Miller farm, Reibold, was the next to agitate the trade on the 20th of the month. It started at 20 barrels an hour and for the first eight hours made 125 barrels. It has not been drilled since and has declined up to the 10th of February to a little more than 8 barrels an hour. It is located about 900 feet south of the old Smick well, apparently on a narrow spur of prolific rock jutting out from the Reibold pool, though almost cut off from the main body by dry holes.

On the 20th reports got out of the McKeown farm well at Cannonsburg and being confounded with John McKeown's Pollock farm well created a panic in the trade. The situation there is not dangerous at present and and is pretty fully set forth in another column. From the time of the Cannonsburg scare, which made the trade nervous, the Jennings well at Brush Creek and Burchfield's wildcat have served to keep speculators on the ragged edge up to the first of the month, though neither amounted to anything when drilled in.

The following summaries give the showing condensed:

WELLS COMPLETED.

	January.			December.		
	Wells.	Prod.	Dry.	Wells.	Prod.	Dry.
Allegany	2	10	..	2	13	..
Bradford	3	9	1	3	3	2
Middle Field	13	56	5	13	105	2
Venango	26	138	5	35	142	8
Clarion	1	16	..	2	3	..
Butler and Armstrong	20	623	5	41	878	16
Washington	2	123	..	3	53	1
Shamopin, etc.	1	25	..	0	0	0
Total	68	1000	16	99	1197	29
Total Dec.	99	1197	29			
Difference	31	197	13			

RIGS UP AND BUILDING.

	Jan. 31, 1887.			Dec. 30, 1887.		
	New Rigs.	Wells Dr'g.	Total.	New Rigs.	Wells Dr'g.	Total.
Allegany	0	1	1	2	2	4
Bradford	0	2	2	1	4	5
Middle Field	7	4	11	4	11	15
Venango	8	17	25	6	25	31
Clarion	6	4	10	1	2	3
Butler & Arm	13	17	30	16	30	46
Washington	8	16	24	8	10	18
Shannopin, etc.	0	9	9	3	6	9
Total	42	70	112	41	90	131
Total Dec. 30.	41	90	131			
Difference	1	20	19			

ALLEGANY.

There were two oil wells finished in the Allegany field during January, having a combined daily production of 10 barrels. No new rigs were built during the month and at its close there was one well drilling, located for a 3 to 6 barrel pumper. In the gas zone around the Allegany field a few wells are drilling for vapor fuel.

BRADFORD.

The Bradford field has brought more oil above ground than it should have done in a specified time. The producers seem to realize this fact and are not hustling in the old field for more. They finished 3 wells in January. Two of these had a combined production of 9 barrels at the close of the month, and the other is a dry wildcat away down in the Kinzua Creek section. The close of the month found two wells drilling, neither of them located to produce a convulsion in the trade. No new rigs to start February with is an indication that the whole caravan has joined the shut-down.

THE MIDDLE FIELD.

The middle field finished 13 wells during the month under review, of which number 5 were dry. Two of these were north of Warren and condemn narrow limits of possible territory. One was in the new Elk county district and adds another finger post to the number already standing to indicate the limits of that development. The productive wells are of the very small, to moderately small order, the best being ten barrel affairs in Elk county. The operations under way at the close of the month comprised 7 rigs and 4 drilling wells. The new rigs are mainly in the Elk county country and their rising spectral-like amid the tall timber of that region is a sign that some people have no code of morals except to endeavor to "get on" in the world. Perhaps they are advocates of "personal liberty" of the type that ignores freedom, that gives the fanciful tastes of the few precedence over the rights of the many. The only other venture of more than passing interest is Carroll's wildcat located on lot 661, Cherry Grove, about one and one-half miles east from the old development on lot 659.

VENANGO.

Old Venango, the pioneer, furnished 26 wells and at the close of the month had a list of operations aggregating 25. It is old enough to know better. It has produced oil since the palmy days of the Cornplanter chieftains, way back in that time over which the mists and glamour of unhistoried years is thrown. With all its later romance and dear memories one dislikes to say anything harsh of it, but truth is eternal. It rises above the history and romance of time, and if the truth is told in this case old Venango is behind the times. It hasn't caught on to the glorious movement toward a glorious end, and it's acting in a villainous way. Still there were 9 fewer wells finished in January than in December, and there were 6 fewer rigs and drilling wells at the close of January than there were at the close of December, and there is some hope that some few people down that way will soon join the majority and be decent.

CLARION.

Clarion produced one of the leading features of the field for January, in the well on the Normal School lot at Clarion. This well was drilled for gas to supply the school buildings, but surprised the trustees of the school and the public by beginning to flow oil on January 5. The sand from which the oil comes was found at a depth of 1,300 feet. The well is rated at 13 barrels a day at this writing, January 10th, and there are four wells drilling and four rigs up in the immediate vicinity. The Producers' Protective Association has bought the Normal School well and tied up about 1,200 acres of territory which will not be drilled until after November 1, and this tract comprises about everything that looks like possible territory. Cadwallader & Lord have their No. 1 well, located in the grove back of the railroad, down about 800 feet and are due to reach the sand from the 15th to the 20th of the month.

BUTLER AND ARMSTRONG.

The shut-down has taken hold on Butler county, evidently. This division of the field completed 41 wells in December, and but 20 in January, a decrease of more than 50 per cent. Rigs compare 13 to 16, a decrease of 3, and drilling wells 17 to 30, a decrease of 13. The new wells of January had a combined production of 623 barrels daily, while those of December did 878, a decrease of 255. The features of this division were the Schlegel & Lentz well at Reibold, which was drilled into the sand on the 14th and started at 20 barrels an hour. It declined

steadily until it was down to 9 barrels an hour, at which figure it held until the 5th of February, when it dropped to but little more than 8 barrels an hour. Its production on the 10th inst. was 200 barrels for 24 hours. The Burchfield wildcat on the Gallagher farm, two and a half miles northeast of the Saxonburg development, came in dry just after the first of February, after having agitated the trade for about two weeks. It made quite a flurry on tapping the sand and the owners made quite a bluff, but proved a failure when drilled in. The Jennings, Roth & Co. venture on the Mashy farm, Brush Creek, attracted a good bit of attention near the close of the month, but was finally put in the 5-barrel class without a record. It is now drilling for the lower sands, if any exist at that point. The Saxonburg field attracted some attention again the first days of February on account of the good showing of the Crawford farm well at the northwest and the J. H. Lonitz farm producer at the southeast. Further developments, however, have removed the fear of any considerable extension of the territory, B. B. Campbell's Smalley farm No. 1 having come in dry on the southeast and Snee No. 5 dry at the northwest, near the Crawford.

WASHINGTON.

This field only added 2 new wells to the producing list with a combined production of 123 barrels. But it created a sensation about the 20th of the month, when the old well of the Manufacturers' Gas Co., on the McKeown farm, Canonsburg district, was freshened up. This old well, drilled in 1886, was a small producer from the "50-foot" sand, but the oil was cased off. In December, 1887, it was deepened to the Gordon sand. In January the casing was drawn so as to let the oil from the "50-foot sand" down, and some increase of gas in the Gordon rock together with the agitation of drilling caused it to flow. It is not considered important since the whole story has been told. To the northeast of this well, on the Buchanan farm, the Fisher Oil Co. has a well partially shut in, but doing about 23 barrels a day. Its exact capacity is known only to the owners, if to them.

John McKeown has been prodding around that country for some time in the belief that somewhere near the old McKeown farm well there was a field. He drilled a duster on the Pollock farm east of the Morganza Reform school property, and started one on the Gibbon farm, south of that property. The Fisher Oil Co. started a well on the Mack just northeast of the Buchanan, and about a mile in advance to the northeast John A. Snee has been drilling. Flinn & Booth have begun drilling on the Morganza farm and have three rigs up, but the Executive Committee of the Producers' Protective Association have succeeded in getting these operations stopped. They have also succeeded in shutting down five of the eight drilling wells at Taylorstown, and the other three are well within the defined limits of the territory.

GREENE COUNTY.

E. M. Hukill keeps up the search for golden grease in the Greene county territory and was rewarded in January with a 25-barrel well on the Girard farm, near Willow Tree. It gets its oil from the shallow or Dunkard Creek sand. Johnston & Hamilton got a showing of oil in their well near Ninevah, in December but just then they broke the tools and have been shut down with a fishing job since then.

WELLS COMPLETED.

Allegany Field.

Twp.	*Owner.*	*Barrels.*
Wirt, lot 47, C H Tew		5
Clarksville, lot 10, M M Congdon		5
Wells completed		2
Production		10

Bradford Field.

Quintuple, Thomas Hanley	3
Foster Brook, E T Co, Kerwin & Co, No 12	6
Warrant 3,085, Newell & Co No 1	dry
Wells completed	3
Production	9
Dry	1

Middle Field.

KINZUA VILLAGE.

Harris, Ed Fogle	dry

WARREN.

Sill, John Truby	dry
Asylum, Jamison	4

HARMONY TWP, FOREST COUNTY.

Connelly, W P Black No 2	dry
Kepler, Beaver & Hale, Fogle & Co No 1	5
Neil, Lord & Henne	dry

COOPER DISTRICT.

Reno, Capt A. V Haight	4

MISCELLANEOUS, ELK COTNTY, ETC.

2032, Boggs, Rosenberg & Co No 4	10
2033, Highland Oil Co No 8	9
" No 11	10
2020, Barnsdall & McDermott	12
3212, Armstrong & Co No 1	2
" No 2	dry
Wells completed	13
Production	56
Dry	5

Venango.

Rynd, Carnahan & Myers	3
McCloclin, McCloclin No 3	4
Turner & Franchin, Lufkins & Myers	5
Raymilton, Krepp, J Patterson wildcat	dry
Dale, Dale Bros	2

SLAB FURNACE.

S P McCalmont, Koch Bros No 2	17
Phila & Bost, Kelley, & Smullin No 9	5
Wicks, Judd & Geiser No I	7
J K Dale, Shafer & Dale, No 4	8

MT. HOPE.

P Stroup, Sheasley & Galbraith No 2	12

BULLION.

Balliett, W T Baum	dry

SIX POINTS.

R S Grant, David Allen	5
R S Grant, Gosser & Co	6

VICINITY EMLENTON.

Squaw Valley, Jones, W Stevenson	3

VICINITY PLEASANTVILLE.

Lyle, Gray & Fullerton	6
Lyle, Alex Lowry	3
Madison, Dodge & Riffenberg	5
West Pithole, J N Windsor	dry
McCalmont, McCalmont	dry
Weekly, B Foggins No II	18
Clark, Corwin & Co	6
Newton, Zittle & Son	8

PITHOLE AND PLUMER.

Duke, W P Black, wildcat	4
Ogley. B F Brundred No 1	3
Davis, W J Innis No 2	dry
Bromley, Bromley & Co No 2	4
Wells completed	26
Production	138
Dry	5

Clarion.

Clarion Normal School	16
Wells completed	1
Production	16

Butler and Armstrong.

Blakeley, Coast & Co No 4	25
Galebaugh, Leidecker Bros No 2	50
Miller, Schlegel & Co	216
Snow, Gantz & Co No 2	30
Jos Critchlow, Steinbaugh & Co est	10
Lloyd, Stage & Co	dry
Thorn Creek, Bufford, Hattery & Co	8
James Bromfield, Campbell & Murphy	20
Chas Duffey, Owen Brady No 7	25

BRUSH CREEK.

Duthil, Burchfield & Co	25
Mashy, Jennings, Roth & Co	5

SAXONBURG.

Adler, Bolard, Greenlee & Co No 2	20
Battenfelder, Extension Oil Co No 7	100
H Lonitz, Golden, Wuller & McBride No 3	25
Frazier, Marshall Oil Co No 1	dry
Reudert, Staley & McDonald No 1	dry
Seibert, Gibson & Gahagen	10
Welch, Root Bros	dry
Mrs Reudert, Davis, Starr & Co No I	dry
Lonitz, Bolard, Greenlee & Co	60
Wells completed	20
Production	623
Dry	5

Washington.

CANONSBURG.

J Buchanan, Fisher Oil Co	23

TAYLORSTOWN.

Vincent Blayney, Washington Oil Co	100
Wells completed	2
Production	123

Greene County.

Willow Tree, Girard, E M Hukill No 3	25
Wells completed	1
Production	25

DRILLING WELLS RIGS UP AND BUILDING JAN. 31, 1888.

Allegany Field.

Lot.	*Owner.*	*Depth.*
Scio lot 46, L G Norton		drilling
Alma lot 4, Breckinridge & Co (shut-down)	2	1200
Clarksville lot 10, Steele & Fields (old)		rig
Wells drilling		1
Total		1

Bradford Field.

Indian Creek, Ramsey & Co	drilling
Mount Jewett, Knox Bros & Co	drilling
Hamlin twp, Van Scoy & Co (shut down)	1100
Wells drilling	2
Total	2

Middle Field.

KINZUA VILLAGE.

Swift, C J Swift	drilling

CLARENDON.

Lot 562, Goal Bros No 6 (fishing)	abandoned
532, C A & D Cornen No 5 (shut down)	900
562, Goal Bros No 7	rig bldg

TIONA.

Lot 109, J W Sherman No 11	rig

CHERRY GROVE.

Lot 661, A J Carroll	drilling

HARMONY TOWNSHIP, FOREST COUNTY.

Dossin, Wolcott & Co No 1	800
Joslin, Wood & Co No 3 (old)	rig
Hays, Dossin McIntyre No 1	rig

MISCELLANEOUS, ELK COUNTY, ETC.

3663, Elk Oil Co No 4 (shut down)	2300
1464, Barnsdall & Co	rig
2676, Wilcox Oil Co	rig
3212, Beam, Ralph & Co	rig bldg
2032, Boggs, Rosenberg & Co	drilling
——, Rollin Dow	rig bldg
5508, (Forest) Shannon Syndicate (shut down)	1675
New rigs	7
Wells drilling	4
Total	11

Venango.

A P Dale, Dale Bros No 3	drilling
Cherrytree, Archer, Taylor & Torrey No 2 (wildcat)	700
Longwell, Longwell & Co (old)	rig
Buxton, Buxton & Co	rig

SLAB FURNACE, ETC.

Keystone, Guckert & Co No 1	drilling
Dr Carey, Dodd & Ritchey No 1	drilling
Haskell, Judd & Geiser No 2	drilling
Haskell, Judd & Geiser No 3	drilling
Raisen, C W Warner No 9	rig bldg
Phila & Bost, Gates & Doty No 3	rig
Keystone, Duffield & Co	rig bldg

HALL'S RUN.

Zeigler, Wolf & Shafer No 1.....plugged
Zeigler, Wolf & Shafer No 1..... 500
Boyle, Deitrick & Co No 1..... 400
Rumbold, Heeter & Co No 3.....drilling
Sayers, Heeter & Co No 1.....drilling
Rumbold, Chas Wurster No 2.....drilling
Zeigler, Baumer & Rapp No 1 .....rig bldg
Rote, Heeter & Co No 2.....rig bldg

RED VALLEY.

J Hetzler, H D Brown No 5.....rig bldg
J Campbell, Ritz & Vensel No 4.....drilling

VICINITY PLEASANTVILLE.

Vose, M N Miles No 2.....drilling
Noyse, Hass Noyes.....drilling
Grandin, Benedict & Bugbee..... 750
Stewarts Run, Carnahan & Son.....rig
Bumstead, Bumstead No 1.....drilling
Zahnizer, Zahnizer & Williams..... 700
Lamb, Alfred Lamb No 1.....rig
Blank W P Black.....(abandoned)

VICINITY EMLENTON.

Fox, Fox & Morgan (old).....rig
Fox, Fox & Morgan (shut down).....rig

Rigs up and building..... 8
Wells drilling..... 17

Total..... 25

Clarion.

Wittaken, Berlin & Son..... 600
Buzza, Heeter & Co.....rig
Fillman, J R Fillman (fishing)..... 800

CLARION BOROUGH.

Arnold lot, Cadwallader & Lord No 1..drilling
Arnold lot, Cadwallader & Lord No 2..drilling
Greenland lot, Rider & Co.....rig
Garvin, Ira C Fuller.....rig
Arnold, Leeper & Co.....rig
Campbell, Cadwallader & Lord.....rig
——J M Kifer.....rig

Rigs up and building 6
Wells drilling..... 4

Total..... 10

Butler and Armstrong.

Farm	*Owner*	*Depth.*
Wm Goering, W L Guckert & White		1200
Galebaugh, Connors, Fishel & J P Bredin No 2		rig
Dodd (Buffalo Creek, Reep & Sutton		drilling
William Bromfield, Davis Bros		drilling
Robert Morrow, Morrow		drilling
Gumper, Brady & Co		rig
Downy, Steinbrook & Co		drilling
Downy, McTammany		1200
Glade Mills, Cappeau & Co		drilling
Reiber, Clark & Co		1000
Burton, Farmers' Oil Co		rig up
Thos Montgomery, Calhoun & Co		rig bldg
Gumper, Gumper		rig bldg
J Black, Burns & Co		rig
Middlesex twp, Bracken & Co		rig bldg

BRUSH CREEK.

Sam Marshall, Munhall & Co.....sand
Bonner, Jennings.....rig
Reynolds, McKelvey & Co.....rig bldg
Drick, Munhall & Co.....rig bldg
Near Jamison's Mills, Unknown party .. . rig

SAXONBURG.

Adler, Troutman Oil Co No 4.....1200
Battenfelder, Extension Oil Co No 10..... rig
Seibert, John A Snee & Co No 5.....drilling
Crawford, Haymaker & Co No 1.....drilling
" " " 2 fishing...sand
Aderhold, Golden, Wuller & McBride No 3.. 800
Helmbold, B B Campbell (old).....rig
Muder, Loan & Co No 2 fishing .....sand
Smalley, B B Campbell No 1.....sand
Logan, Fishel & Co.....drilling
J H Lonitz, Bolard, Greenlee & Co No 4.... rig

Rigs up and building..... 13
Wells drilling..... 17

Total..... 30

Washington.

Farm.	*Owner.*	*Depth.*
McKeesport, Stone & Co (shut-down)		1800
Bane, Ten-Mile Oil Co (shut-down)		1039
Bailey, McKenna Oil Co		1000
Cameron, Willets & Young (fishing)		1740
Miller, Marshall Oil Co No 2 (fishing)		1700
S Fergus, S Fergus		2300
McBurney, Wheeling Oil Co		sand
Munce, I. Willets & Son No 2		drilling
Gordon, P L & H Co No 8		rig
Kammerer's Mills, Willets & Son		sand

CANNONSBURG.

W Pollock, Scott & Co.....drilling
A H Griffin, John McKeown..... rig
Kelso, Cannonsburg Light & Heat Co..... rig
McNamara, Fisher, Guffy & Co ..... rig
McPherson, John A Snee & Co.....drilling
Morganza, Flinn & Booth..... rig

TAYLORSTOWN.

Hutchison, Washington Oil Co No 1.....1600
J M McMannus, " " No 2 (shut-down).....2480
Neeley, Washington Oil Co No 1 (shut-down).....2558
Sam Wright, Washington Oil Co.....1600
Jas Hodgens, Washington Oil Co No 2..... 500
" " " 3..... 400
" " " 4..... rig
Hilton, Ellsworth & Preston No 1.....2200
" " " No 2.....1200
Grimes, Marshall Oil Co..... 600
Allison, R H Thayer..... rig
Crawford, Palmer & Co..... rig

Rigs up and building..... 8
Wells drilling..... 16

Total..... 24

Shannopin.

Oakdale, A F Allen Brown & Co.....drilling
D P Collins A F Allen Brown & Tomlinson.....drilling

GREENE COUNTY.

Hathaway Danstown, E M Hukill No 1.drilling
Evans, Mt Morris, " " No 1.drilling
Fordyce " " No 1(shut down)..... 1360
D L Donelly, Alexander & Co..... 700
" E M Hukill.....drilling
Nineveh, Johnson & Hamilton (fishing)...sand

GREENSBORO.

Rubbert & Williams, Jones farm.....drilling
James Ohlsom, " " .....drilling

Rigs..... 0
Drilling..... 9

Total..... 9

OPERATIONS FOR GAS.

Wells Finished in January, 1888.

ALLEGANY FIELD.

Wirt, lot 1, Empire Gas Co.....gas

Middle Field.

WARREN COUNTY.

Lot 212, Pennsylvania Gas Co No 19.....gas
Wilcox, National Transit Co No 33.....gas

VENANGO.

S P McCalmont, Oil City Fuel Supply Co....gas
Shafer, " " " ....gas
Allegheny bank tract, Oil City Fuel Supply Co No 2.....gas
S P McCalmont, Oil City Fuel Supply Co No 1.....gas
Deshner, Oil City Fuel Supply Co No 1.....gas
McKever, Wm McKever No 1.....gas
Keverline, Oil City Fuel Supply Co No 1....gas
Emlenton, Emlenton Citizens' Gas Co.....dry

WASHINGTON.

Vanceville, Willetts & Son.....gas
Brownsville, Home Natural Gas Co No 3....gas

Wells completed..... 13

WELLS DRILLING AND RIGS UP AND BUILDING FOR GAS.

Allegany Field.

Wirt, Lot 1, Empire Gas Co.....drilling
" 58, Cuba Gas Co.....drilling
Clarksville, Lot 2, National Transit Co..drilling

Bradford Field.

Mack, Manufacturers' Gas Co, (shut down) 750

Middle Field.

KINZUA VILLAGE.

Richardson, T G Phillips No 1.....rig bldg

WARREN COUNTY.

Lot 253, Pennsylvania Gas Co, No 20 (old).. rig

CLARENDON.

Lot 52, Clarendon Mutual Gas Association No 3.....drilling
Marienville, Kahle Bros.....drilling

Venango.

Haight, W P Black No 2.....drilling
Bedin, Oil City Fuel Supply No 1.....drilling
" " No 2.....drilling

WASHINGTON.

Kammerer, Willets & Son.....drilling

Rigs up or building..... 1
Wells drilling..... 9

Total..... 10

Not Recommended for Adoption Here.

The French Abbe Huc, lately returned from China, thus describes the system of deep-earth boring practiced in the district in which he has for some time resided. A wooden tube, 6 feet in length, is first driven down through the surface soil. This tube is held at the surface of the ground by a large flagstone, having a hole in the center to allow the tube to pass through and to project a little above it. A cylindrical mass of iron, weighing about 400 pounds, hollow and pointed at its lower end, and having lateral notches or apertures, is jerked up and down in this tube at the end of a lever, from which it is suspended by a rope. This kind of "monkey" disintegrates the rock, the debris of which, converted into sludge by water poured in, finds its way through the lateral apertures into the interior of the cylinder. By raising the latter at intervals, this sludge is removed from the borehole. The rate of boring in rock of ordinary hardness is one foot in 12 hours. Only one man is employed at one time to work the lever. By this means wells of 1,800 feet deep are sunk in about two years by the labor of three men, relieving one another every six hours.

Clarion District W. D. U.

There was a large turnout at Friday evening's meeting of the P. P. A. and the Well Drillers' Union, and everybody was happy. The pay roll for January has been made out and forwarded to headquarters, and by the 10th inst. it is expected that the money to pay the members will be on hand. The amount required is about $3,500. There are now 170 members in this one branch alone, and about 1,600 members throughout the country entire. There has been some considerable fear among our merchants that this shut-down would ruin trade. It may have weakened trade to a certain extent within the past few months, but will not the circulation of the $3,500 give it more backbone and stiffen it up again? The greater amount of the money will be received by people of Emlenton and immediate vicinity, and will gain circulation and everybody will receive a benefit. Of course this money will not create a big boom and fill the streets and stores with hundreds of people, but it is going to furnish the necessities of life for some and "pocket" money for others, and keep matters moving along serenely. The limit to become a member and receive all the benefits as such is until February 21. After that date should you become a member you receive no benefit. We would urge all who have not yet done so, to join and aid the movement.—*Emlenton News.*

THE connecting pipe line from Cygnet to Lima was completed Feb. 2, and the first oil sent through on Feb. 3. It is a six-inch line and it took 9,000 barrels of oil to fill it. It was 19 hours from the time oil was turned into the line before it began to come out at Lima. A 60 ton pump is used at Cygnet aud a smaller one at the Findlay relay station. Construction was begun December 27.

INDIANAPOLIS is still having a lively time with its natural gas ordinance. What with the Indianapolis company and the Standard working for changes in the ordinance and the Broad Ripple and Consumers' Trust working against any change, the average Councilman in the Hoosier capital can hardly sleep o' nights,

THE PETROLEUM AGE.

DEVOTED TO THE INTERESTS OF THE PETROLEUM TRADE.

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CURRENT COMMENTS.

CARMI, Ill., might have remained unknown except to the geographers had it not been for the colossal lying of Mythical McLaughlin.

***

NEW uses for petroleum are being discovered at a rate that promises to make a demand even for the inferior product of the Russian field.

***

NATURAL gas properly used is one of the greatest economic and industrial agents. Neglected, it becomes a vicious and destructive demon.

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THE listing of pipe line certificates on the New York Stock Exchange will bring a new element into the trade of importance to both speculators and producers.

***

WE are proud of our portrait of F. W. Bowen, editor of the Oil City *Blizzard*—almost as proud of it as of the thirteen years' acquaintance with the subject of it.

***

IT will probably be a long time before the narrow gauge railroad, as an institution of progress, gets another such boom as it got in the oil country a few years ago.

***

THE crude market on the Petrolea, Ont., Exchange ranges from seventy to seventy-five cents. The Canadians are evidently not finding the oil business all profit.

***

THE producer of oil in the Northwestern Ohio oil field has suffered much, but the introduction of his product for fuel purposes is making rapid progress and he will yet receive his reward.

***

IN this region of oil, coal and timber there is reckless waste. It is a pity that ten dollars' worth of timber should be destroyed to get bark enough to tan fifty cents' worth of shoe leather.

***

THE surplus stock of crude oil in the New York and Pennsylvania oil region has been reduced over 3,700,000 barrels the past three months. This means the lifting of a fair portion of a heavy burden.

***

THE foreign refined markets were more excited last month than at any time since the great corner in refined of 1876, when crude was boomed to four dollars a barrel for the last time and refined was held in New York at thirty cents a gallon for export oil. The foreigners, it appears, were just catching on to the importance of the shut-in movement. Some people nearer home have not reached a realizing sense of it yet.

***

NATURAL gas leaks may be hunted for with a lighted match. It may be well to remember, however, that when leaks are found by this method there is usually a great depreciation in the value of buildings in the vicinity.

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THE Lucigen, the new light produced by burning oil atomized by a strong current of air, far surpasses the electric light for outdoor illumination and is cheaper. This use alone will cause a considerable consumption of petroleum this year.

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THE idleness of drillers and tool-dressers during the term of the shut-down movement enforces idleness upon other classes of workmen. These should not be allowed to suffer, even though their co-operation is not necessary to the success of the plan.

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WHILE not fully endorsing all of Mr. Charles A. Ashburner's views of the origin of petroleum and natural gas, or of the localities where they may be found, we commend his article in this issue as a careful and painstaking, elaborate and interesting dissertation well worthy of careful perusal.

***

OTHER proof of the success of the Pennsylvania producers' heroic movement for the permanent improvement of their business, than that of the operations report for January, is not needed. A list of the work under way, smaller than at any time for fifteen years, ought to be proof conclusive to the most skeptical.

***

INDIANAPOLIS is busy getting natural gas by booming its people's Gas Trust and holding firmly to its reasonable ordinance regulations, but it is not so engrossed in this work as to prevent it convicting ballot box jugglers, tally sheet forgers and some other varities of emboldened and semi-respectable criminals.

***

THE Americans are a hurrying nation. And the people of the oil and gas fields have been rushing things more vigorously, even, than their neighbors. But now, it seems, they are going to pause long enough to get their breath, and while getting it may come to the philosophical conclusion that it is better to not attain too high a speed.

***

THERE are signs of the times strongly indicative that the days of trusts are numbered and that they will be few. Congressional action on this subject is none too soon. These commercial monstrosities, with unlimited capital and no legal existence, have done more to corrupt the business morals of the time than any other agent, not even excepting the professional "boodle" politician, who has been tolerated in this country all too long.

***

THE prediction that the natural gas business reached the zenith of development in 1886 is now going the rounds of the press. If the reference is simply to the "craze" which ran quite largely into wildcat stock companies, the prediction is probably true, but if it means that the legitimate business of supplying natural gas to consumers has reached its height there are no indications that the prediction will be verified. There is every reason to believe that more money will be expended in the systematic, careful search for natural gas fuel and for piping it to consumers this year than there was during 1886, and there may be a still greater amount next year, as the benefits of the new fuel are more fully appreciated, though there may be a diminution in the amount of capital stock subscribed for in natural gas companies.

Justus C. McMullen.

A life has gone out. It has left a void that it seems can never be filled. A life so noble, so great that it appears yet, to sorrowing friends, impossible that they will know it no more forever. Yet all that was mortal of Justus C. McMullen, publisher of THE PETROLEUM AGE, and one of the editors and publishers of the *Daily Oil News*, was laid in the cold and silent grave on Feb. 2, mourned by the thousands who knew him in life, and knew naught of him but that which was praiseworthy and good. There are few men like him. His niche in the world may never be filled. Ceaseless in his activity, stern and uncompromising in his devotion to duty, he was yet kind, generous and affable in his relations with men. He was honored by all and loved by many. The bitter foe of rich and powerful oppressors, he had ever a warm corner in his heart for the poor and oppressed. His integrity was beyond question, and in the fight for right he was unflinching, unwavering, unconquerable. But the dread destroyer came and took away the light and life of a happy household and left desolation in its stead.

Mr. McMullen's sudden death from pleurisy on the morning of January 31 was announced when the last issue of the AGE was in press, and a brief notice was sent to our readers. Much of the best that was in that book came from his pen. The funeral took place on Feb. 2, and a whole city was in mourning. The last sad rites were attended by the Oil Exchange, the Producers' Protective Association and the Bradford Typographical Union as organizations, and by a large concourse of people, hundreds being unable to gain admission to the Presbyterian church, where Rev. Edward Bryan pronounced the funeral oration.

J. C. McMullen was born in Orange county, N. Y., in 1851, and resided with his father on the farm until young manhood asserted itself and he went forth into the world. Obtaining a free scholarship in Cornell University, he literally worked his way through, graduating from the civil engineering department in 1876. The next year he came to the oil regions, entering the store of J. M. Place at St. Petersburg, and while there did his first newspaper work in reporting a temperance lecture of Marshal Swartzwelder for the *Derrick*. This effort, on which he worked all night, attracted such favorable notice that he was at once given a position on the regular staff of that paper. Then he came in contact with oil statistics and his real genius became apparent. He has left an undying imprint on the history of this wonderful industry by devising for it a system of re-

liable and accurate statistics, a service for which he sought no recompense and received none during his life. In 1879 he came with the tide to Bradford and worked successively on the *Breeze*, the *Era* and the *Star*. In 1883 he became part owner and managing spirit in THE PETROLEUM AGE, though devoting much of his time to "scouting" in the wilds of Warren and Forest counties. About the middle of July, 1887, he began the work of establishing the *Daily Oil News*, associating with him Mr. E. A. Bradshaw, and about the 1st of October that publication was first presented to the public. On the 1st of December he became sole proprieior of the AGE.

Such, in brief, is the history of a busy life. This outline gives no adequate idea of the tireless energy of the man who scorned to stop to rest. Even when sick unto death he would not complain. He admired that passage in *The Egotist:* "It has been the rule of my life never to complain. It only weakens you in the eyes of men; and, if they think you weak, it is an invitation for them to tramp upon you. To the outward, at least, be unmoved; and seek to be so as well as well as to appear so. Conquer, as far as you can, the disposition to be moved by what men do or say to you. Keep steadily on, trampling under foot all petty vexations and annoyances, which do so much to make up the burden of life. Take no heed of men's opinions, save as to you seems good. The most miserable creature in the world is he who lives to obtain men's approving speeches. He always fails to do it, and has spent his life in seeking that which is of little worth, and lost that which is of great worth—his own commendation, his own approval, the feeling of joy in his own manhood."

What wonder this sentiment should fall pleasantly on his consciousness. It was the sentiment he lived every day. It might have been born of him. Uncomplaining, unmindful of criticism or praise, he lived pursuing his own path of right, whether it led through thickets of thorns or banks of fragrant flowers, and when he was cut down by the sword of death in the prime of life he was still possessed of the joy of an untarnished, noble manhood, an honor to the aged mother who survives him, a fond memory to his loving wife, now the only protector of his bright little daughter.

Following are a few extracts from the many tributes offered by newspaper friends who knew him well:

In the prime and vigor of a useful and honorable life, a good citizen, talented journalist and warm-hearted friend has been called higher. The editorial fraternity of the oil country will mourn him as a brother whose professional zeal and personal nobility of character commanded the love and respect of every member in it. It would be impossible to discover an unmanly or dishonorable act in his career. Perhaps his most distinguishing trait was a generous enthusiasm, which caused him to throw himself into all his labors with an ardor and zeal unbounded.

Thoroughness with him was everything. He considered it a prime requisite and always acted on the principle that whatsoever useful his hand found to do he must do with all his might. His acquaintances will recall many casses illustrating this, as in his walking miles over McKean county hills to ascertain the exact status of a well, when the same could have been approximated. But it was this thoroughness and exactness which gave value to his statistical work.

As a newspaper man he did much good work, more particularly in connection with oleaginous matters. A man of the most temperate habits and correct life, he carried about with him an inexhaustible fund of good humor, and his industry and cheerfulness were alike remarkable. To strong mental gifts he united a modest bearing and a thoroughly amiable disposition, and it may truly be said of him that he made hosts of friends and very few enemies wherever he went. He was strictly conscientious and would at all times and under all circumstances battle for what he believed to be right, even though his own interests might be best advanced by pursuing a different course. His death will be sincerely mourned by many. As we—his colaborers—wait here for the decree which shall summon us to the same dreamless sleep which now is his, we can but bear testimony to his worth and embalm him in our memories.—*F. W. Bowen, in Oil City Blizzard.*

How the memory vibrates with the touch that makes us kin! A forlorn-looking individual stopped me on my way this morning and with a tone full of genuine sadness exclaimed, "Poor McMullen!" I looked hard at the man until his features slowly brought back the days when he set type for McMullen's copy and for mine. So we exchanged condolence. And now as my copy goes in alone I trust it will appear to be set with somewhat of our common mood. We knew McMullen well, and amidst the many tributes to his memory we cannot fail to recognize one quality luminous over all. It was his integrity—a good-natured but undeviating, uncompromising adherence to what he believed to be right. He caught the spirit of public measures calculated to overcome or alleviate oppressive or unfortunate popular conditions, and became so infused with it that his personal interests were subordinate if not forgotten. The cause of the people, as he understood it, was his own. He was its humble servant. If he was eccentric it was in the intensity of his convictions. If he was impractical it was because a straight course was to him the one of least resistance. If he sometimes appeared impetuous and even immoderate it was because of his impatience at the meandering progress of the body politic. He and I were neighbors, and we liked each other, I am sure. Why, he cannot tell, and so I do. R. B. S.

Death has again entered the ranks of Bradford journalists and taken one of its brightest, most upright and honored members. Col. L. M. Morton, J. K. Graham, Thos. E. Kern, Justus C. McMullen have in the past five years been summoned to lay down the pen and the burdens of an exacting profession and join the silent majority. All were men of marked ability and brilliant intellect, yet none in the ranks of local laborers, living or dead, were endowed with a higher purpose, more intense enthusiasm or more indefatigable persistence in advocating what he believed to be right than he whose active frame now lies cold in death and whose restless spirit is stilled forever. J. C. McMullen was one of those rare creations of humanity who find it impossible to look upon life as a play-spell or upon its purpose and mission the accumulation of wealth or the enjoyment of ease and pleasure. His only happiness was in unceasing work. For years he had hardly known an idle moment. His vision of the duties and responsibilities of life and his profession were unusually enlarged, and possessed of extreme conscientiousness he was ready to sacrifice strength, ease, comfort and life itself in the performance of his share of those duties. He did sacrifice his life to his profession, his ambition and his view of a duty and obligation to those who should now be prompt to show their appreciation.—*Bradford Star.*

The intelligence that the pale flag has been advanced to the bedside of the well known and popular newspaper man, throwing its chill upon the heart of him we all knew so well, will cause a shock to every man in the oil country. "Mac" was known by everyone, and everyone had a kind word for him and a warm appreciation of his worth.—*Oil City Derrick.*

Few men in the oil region enjoyed a wider acquaintance than Mr. McMullen. Intimately associated with the journalistic life of the country, he has been prominently before the public for many years. He enjoyed a wide reputation as an oil statistician and was ever regarded as one of the most competent and reliable men in his peculiar line of work.—*Bradford Era.*

The death of Justus C. McMullen, one of the editors of the Bradford *Oil News*, is announced. He was one of the brightest and most energetic journalists that oil region journalism has known, and deep sorrow is created in an extended circle of friends by his early death, which resulted from exposure while in the performance of duty.—*Jamestown Journal.*

He was of a frank, open-hearted, generons nature, a warm friend, an excellent citizen, and an honest and honorable man. Temperate, painstaking and correct to the minutest detail, he attained a reputation in his profession that will live long after him. His loss is one that will be keenly felt wherever he was known. —*Titusville Herald.*

Natural Gas and Plate Glass.

The *Pittsburg Dispatch* says: "There are now sixteen glass factories represented in this city which makes a specialty of window glass, four of them adding bottles to their special line. The introdnction of natural gas had much to do with improving the product. Under old methods of producing the required heat burned into the glass a smoky surface, which could not be washed out, and which it was very difficult to avoid. The natural gas has altogether obviated this difficulty, and the material comes out in its finished state clean and light. The window-glass factories of Pittsburg are now making goods, grade for grade, fully equal to those which come from Belgium, the great European producer, or from England. The bluish-green tint which once characterized the home article was due to the presence of iron in the material used, and it was not until late years that the manufacturer here was able to reach the yellowish green or straw tint of the French glass. The result of this improvement in the quality of the home product has been to practically shut out the imported article. Representative men in this Pittsburg industry report that the trade here has more than doubled in the past decade."

EDITOR F. W. BOWEN.

THE MAN WHO BLOWS BITING BLIZZARD BLASTS INTO WRONG DOING.

PERHAPS a majority of our readers will need no introduction to the subject of this excellent portrait, which first appeared in the current number of *Drift*. But some, who are better acquainted with the quality of the Dakotah blizzard than that of the much better and more stinging variety, the Oil City *Blizzard*, may need to be told that it is Frank W. Bowen, editor-in-chief of the last named free-playing zephyr, which

"Blows on whom it pleases,
And for others' snuff ne'er sneezes."

Br'er Bowen's *Blizzard* when dealing with the good and true blows you as gently as the perfume-laden breezes of a mild summer evening, but when directed against public wrongs it rushes headlong and irresistible, sweeping everything before it, and it's a cold day for monopoly when it is abroad in the land. Mr. Bowen modestly says of himself:

DEAR EDITOR:—You ask me for a picture to adorn a page of *Drift*, and guarantee that the artist will not make me look like a burglar. To accomplish this he must display considerable talent. You likewise request a biographical sketch. I mention these facts merely to show that 'tis a case of the office seeking the man, and at the same time to allay the apprehensions of my creditors, who might infer that I was squandering too much wealth in bringing out the picture.

To begin at the beginning, I was born in the town of Portland, Chautauqua county, N. Y., May 27, 1852. I have always looked upon this as the most noteworthy event in my career, but with the appearance of my picture in *Drift* it will probably drift into second place. My father was a farmer, and he always sturdily maintained that I was a self-made man. His broad acres were located on the Chautauqua hills, where the stiff breeze from Lake Erie whistled through my raven ringlets, and, perhaps, inspired, early in my existence, a sneaking admiration for the potency of the blizzard. Yes, I was a farmer's boy, and I'm proud of it. There is nothing like the farm—for boys; but now that I am older grown, I prefer to put away boyish things.

What education I have was acquired at the Jamestown Union school and Collegiate institute at Jamestown, N. Y., but there was considerable left after I got it—in fact, what I took away was hardly noticed.

A propensity for newspaper cussidness was developed early in my life. My first enterprise, though something of a success financially, had a painful termination. Having collected a dozen or more old papers, I started out to sell them. I selected as customers the sons of wealthy parents—boys who had money. They purchased my papers readily enough, without reference to dates, and I carried the proceeds home in triumph, only to get a licking and be compelled to return the money.

At school it was the same way. I have a distinct recollection of how I once wrote a letter for the Jamestown *Journal*, giving one of the teachers a turning over, and how Ernest Willard, now of the Rochester *Chronicle-Democrat*, and myself came mighty near being expelled in consequence. And the joke of it was, Willard was as innocent in the matter as a babe unborn.

I always wanted to learn the printing business, but my parents objected, on the ground that the associations were not such as would tend to develop a great and good man. It seems they entertained an idea of making something of that kind of me. I finally prevailed upon them, however, and went to work in the office of the Chautauqua *Democrat*. I learned to set type; but, before I had completed my apprenticeship, Brooks Fletcher, the editor, ascertained that I could gather and write news items fairly. Being naturally of a quiet and retiring disposition, with a marked predilection for indoor exercise, he considerately allowed me to do the legging.

From Jamestown I went to Corry, played a brief engagement on the *Daily Blade*, then worked for a time on the Parker *Daily*, and subsequently put in seven years preparing copy and killing cockroaches in the *Derrick* office. Six years ago the *Blizzard* was established, since which time I've been kept reasonably busy trying to reform the country, but thus far have met with indifferent success.

With reference to the picture, it should be stated, in justice to myself, that the photograph was taken three or four years ago, and I've been improving ever since. I'm much handsomer now than I was then, but the crowded condition of my columns, in the photographer's books, renders the procuring of a later edition impracticable.

In conclusion, I might say that I never smoked a cigar, never took a chew of tobacco, never drank any intoxicating liquors, and never played a game of cards—I say I might say this, but I will not. F. W. BOWEN.

In presenting the above picture and modest autobiography, *Drift* truthfully says of him:

"Fat, sleek thieves he particularly loves to tackle, and when any greedy monopolist or corporation crook moves into Pennsylvania with an idea of practicing squatter sovereignty, or attempts to load up and carry away certain portions of the State without saying anything about it, Brother Bowen is very liable to reach over the dash-board, so to speak, and call a halt. His call is almost always listened to with rapt attention.

"While most of his paragraphs have a stinger to them, there is a current of humor pervading them all that at once dispels any idea that he lays awake nights trying to be mean. If the author of "Little Blizzards" ever said a mean thing the reader may rest assured that there was a laugh in it somewhere, and a wholesome moral to adorn it."

BYRON D. BENSON.

A USEFUL LIFE THAT WAS CUT SHORT BY A CANCER.

BYRON D. Benson, President of the Board of Directors of the Tidewater Pipe Company, died at the Averill House, New York, at 10:30 a. m., on Feb. 8, of cancer. The body was removed to Titusville for burial, the funeral taking place from his home in that city on Saturday, Feb. 11. Of his life, disease and death the Titusville *Herald* says:

About five years ago a small sized pimple, strongly resembling a wart, made its appearance on the under lip. This continued to exist, and gradually developed into a cancer. Early in 1886 the surgeon's skill was resorted to and the growth removed. After the operation was performed the trouble was thought to be over and Mr. Benson was thought to be completely cured. Subsequent events, however, proved that the trouble was far from being eradicated, for about the following October (1886) a lump of more than ordinary size made its appearance on the right side of the face, immediately over the sub-maxilliary gland. Expert treatment of the newly discovered trouble was at once obtained. There was no mistaking the fact that the patient was now afflicted with cancer, and measures were immediately taken to check its further progress. All that medical and surgical skill could bring to bear was forthcoming. The sufferer was thought to be holding his own with the fearful malady until Sunday, the 22d of last January, when through the rupture of a vein in the healing wound nearly a gallon of blood was lost. This loss of life element so weakened the patient that grave doubts were entertained at the time of his recovery from the shock, but his strength seemed equal to the emergency, and to the great delight of all he gave evidence of enduring the severe and fearful strain. This hope, however, was of the moment. After his first rally his strength increased satisfactorily for about ten days, and this increase was scarcely checked by a slight hemorrhage occurring one week after the first. From this time, however, the patient gradually grew weaker, his stomach refusing to retain food and his nervous system being completely broken. Tuesday noon a message from the attending physicians announced that the last hope was gone, and and this was followed by the telegram of yesterday announcing the death.

Byron David Benson was born in Fa-

bius, Onondaga county, N. Y., February 29, 1832. At the age of 28 years he was elected sheriff of the county, serving a term of three years. In March, 1865, he moved to Enterprise, Warren county, Pa., and engaged in the lumber business. Through skillful handling the business gradually assumed large proportions. Oil was discovered in the immediate vicinity and a considerable amount of the land controlled by the lumber company proved prolific territory. Mr. Benson was the head of the company which owned most of the rich "Colorado" oil field located up Pine Creek, about two and a half miles from Enterprise. In the winter of '72-'3 Mr. Benson removed from Enterprise to this city, purchasing the residence at the corner of Oak and Perry streets, which he had since made his permanent home. During the existence of the Conduit Pipe Line he was the manager, and in that position showed to the world his extraordinary managerial talents. No obstacles or difficulties daunted him when once his mind was centered on any particular business matter. The greater the magnitude of the transaction the more it pleased him, and the more the hindrances met with the harder he worked for a successful accomplishment. His connection with the Conduit only ceased with the sale of the line by the principal owner, Dr. Hostetter. He at once turned his attention to the creating of a company which could transport beyond the difficulties that had been encountered by the Conduit line. The Tidewater Pipe Company, organized in the fall of 1878, was the outcome of this work. All who are acquainted with the history of oil and oildom are cognizant of the important position this company holds to-day. The first to conceive the idea, Mr. Benson, had always been the recognized head of this important, extensive and influential business enterprise and is the only person who had occupied the position of president, having been elected to that honorable position nine consecutive times. He was re-elected to the office at the annual election last month with not one dissenting voice. It was at the annual meeting held in January of 1887 that the deceased paid his last visit to this city.

The New Conference Rules.

President C. L. Wheeler called the Oil Exchange to order at the close of the market Feb. 13, to take action upon the amendment to rule 24 and the new rules proposed by the conference committees of the exchanges at their meeting in New York, Feb. 1. The amendment to rule 24 and the new rule relative to the furnishing of quotations were concurred in unanimously. Following are the rules as acted upon, rule 24 being amended to read·

"The exchanges shall be open for business from 10 o'clock a. m. until 3 o'clock p. m., (except on Saturdays, when they shall close at 12 o'clock m.) On Sundays and legal holidays (occurring either in Pennsylvania or New York,) the exchanges shall be closed."

Rule No.—The publishing, circulating or sending of any false rumor or report, or withholding important information, when pretending to state the facts, with the design to affect the market price of petroleum, or the procuring, aiding or abetting of the same to be done by another, is positively forbidden, and shall render any member so offending, liable to fine, suspension or expulsion, upon conviction thereof, under the provisions of Conference rule, No. 30.

Rule No.—No exchange being a member of this conference shall furnish to any other exchange, that is not a member of the conference, the official quotations of the purchases and sales of petroleum pipe line certificates made by its members, and any exchange being a member of the conference shall, upon demand, furnish by wire to any other member of the conference, at the latter's expense, the official quotations of the purchases and sales of petroleum pipe line certificates made by its members.

On motion of Mr. J. E. Haskell rule 24 was amended without a word of opposition and by a unanimous vote. When Mr. Haskell moved the adoption of the rule relative to the circulation of false reports, Mr. J. C. Gormley moved to amend by striking out the words "or withholding important information when pretending to state the facts," saying that he believed this portion of the rule might be misconstrued to the injury of innocent persons. Capt. J. T. Jones asked the adoption of the rule just as it read. Referring to the reports of the Canonsburg well, of recent date, he said that was an instance. A well had been reported at 40 barrels an hour. He sought information and was told it had made two flows, one of 35 barrels and one of 45 barrels. It was not stated that they were made 24 hours apart, and following the first report would naturally lead to the belief that they were made about an hour apart. Mr. Gormley again spoke in support of his amendment. Mr. Haskell hoped the rule would pass as proposed. It was a question of the honor of the exchange. He believed there should be no loophole for a guilty man to escape. If that clause was struck out people would say, "the Exchange winks when its members send out false reports," The amendment was voted down and the ruled passed with but few dissenting voices.

In connection with the last rule, President Wheeler said, that it was proposed by the committee from the Consolidated Exchange, and included stock quotations at first, to which the Western committees would not agree, as they did not want to take part in the fight between the Consolidated Exchange and the Stock Exchange. It was then amended to apply only to oil, and it was understood and agreed to by all members of the Conference present, that it should apply only to "official" communication, and not be construed as in any way restricting individual members of the exchanges, who may, as in the past, quote the market to, or do business with any one, whether a member of a Conference Exchange or not. The rule was adopted without opposition.

Mr. J. E. Haskell then proposed the following changes in the Clearing House rules to adapt them to the Saturday closing scheme, and they were laid over under the rules to be acted on at a subsequent meeting, to be called for the purpose.

Rule 5 to be amended to read: All transactions not otherwise specified shall be in regular oil. Before 11 a. m. transactions may be in cash, or regular oil, (except on Saturdays, when cash transactions shall cease at 10:30. After 10:30 a. m. on Saturdays and 11 a. m. other days,) all transactions shall be in regular oil or time contracts. Cash oil shall be cleared on day of sale. Regular oil shall be cleared on the following business day.

Rule 7 to read: All statements accompanied by certified check covering difference, or by oil, or accepted order must be placed in the Clearing House (by 10:30 a. m. on Saturdays and 12 m. all other days) and the Clearing House shall settle all accounts by 2:30 p. m. on the same day by giving checks and delivering the oil.

Rule 8 to read: A failure to put in statement as provided in the preceding section by (10:30 a. m. Saturdays and 12 m, all other days) will subject the delinquent, etc. Remainder of rule unchanged.

Rule 14 to read: Notices on borrowed or loaned oil shall be given before (10:15 a. m.) and when such notice is given the oil shall be cleared the same day. Rules 15 and 16 relating to sellers' and buyers' options to be changed in the same way, making the time for giving notice 10:15 a. m. instead of 10:45 a. m.

National Oil Trust Company.

In connection with the telegram from St. Louis, announcing a big strike of oil in Indian Territory, the suggestion was made that there might be no National Oil Trust company in existence. The company is there all right. A friend of THE PETROLEUM AGE, a gentleman most thoroughly informed on oil matters, has handed us a prospectus bearing the inscription on the title page, "The National Oil Trust Co., operating in the Indian Territory." Turning the cover we learn that it is incorporated under the laws of Illinois, with its principal office in East St. Louis and a branch office at 621 Chestnut street, St. Louis. It is a creation of this year, with a capital stock of $10,000,000, divided into shares having a par value of $10 each, full paid and non-assessable. The officers are: Wm. A. Adams, President; Jos. W. Buel, Vice-President; Geo. A. Hynes, Secretary and Treasurer; Directors, F. G. Flannagan, E. H. Smith, H. W. Faucett and Thos. R. Reynolds.

The prospectus says: "The object of this company is to develop petroleum in the Indian Territory, where it has been known to exist for many years prior to its purchase by the different tribes of Indians. Previous to the war, Lewis Ross, a brother to the Old Chief, John Ross, was producing salt at the Grand Saline, on the Grand River, and desiring to increase the production he sunk the well some 700 feet, and struck a vein of oil that flowed by estimate about 10 barrels per day for nearly a year, until the pressure of gas became exhausted and failed to support the volume of water. Other evidence of its existence in large deposits are the many outcroppings of fine green oil on the water springs and streams. These springs are highly valued by the citizens for their medicinal properties, especially those at New Springs Place in Going Snake District, Cherokee Nation, also the Boyd Springs in the Chickasaw Nation, where the natives resort in great numbers and light their camps with the gas, by inserting a tube or gun barrel in the ground. These main deposits lie on the Western base of the Boston mountains and form a belt of oil producing territory from ten to twenty miles wide and 250 miles long, while the franchises cover the entire Cherokee property east of 96 degrees, longitude, and the Choctaw Nation, extending from Kansas to the Red River,

or Texas line, embracing some 20,000 square miles, or about 13,000,000 acres, giving entire monopoly of production, as well as prices."

The special act of the Cherokee and Choctaw Councils granting the franchises and concessions to citizens of those nations, afterward transferred to Dr. H. W. Faucett, of New York, is cited together with the decision of the Interior Department at Washington to the effect that those Nations had a right to make such contracts. The concessions confer xclusive right "to produce, transport by pipe line, and refine petroleum." They state that they have "one rig up and machinery and tools on the ground in the Choctaw Nation, on the Boggy, 7 miles south of Lehigh, the great coal district, or 14 miles west of Atoka on the Missouri, Kansas & Texas railroad, and another rig partially up at Alum Bluff, on the Illinois river, Going Snake District, Cherokee Nation." The company is to pay a royalty of ten per cent., five per cent. to the Nations and five per cent. to the citizens who obtained the franchises.

The circular refers to the growing demand for petroleum and its products, and says it estimates a present local demand for 1,000 to 2,000 barrels daily, "and at the present low prices there is a net proceed with a 60 per cent. yield of $2,000 to $2,500 on every thousand barrels produced, transported by pipe line and refined."

Written on a page of the book, under date of Feb. 2, 1888, is the following: "We have two rigs up and one well 917 feet deep; struck one crevice of oil and then salt water. We are now casing it off—entirely in slate and sand rock alternately and indications very fine for a large well. GEO. A. HYNES.
Secretary."

The intelligence is also conveyed that the company has a few of these ten-dollar shares, treasury stock, for sale at the modest price of twenty-five cents. Possibly the reports of a great oil well having been struck near Raleigh may have been sent out to accelerate the sale of this stock.

Right From the Shoulder.

In an argument before the Congressional committee on manufactures last week, Representative Rayner, of Maryland, defined his anti-trust monopoly bill. Open and covert apologists for trusts such as the literary engines of the Standard newspaper bureau will find something to chew upon in his words. After showing that the bill is constitutional under the power to regulate commerce, "will you delay," said he, "a report upon this bill one moment longer, in view of everything that you know upon these infamous combinations to bankrupt private enterprise, to depredate upon the business interest and to plunder the people of this country? There is not a day that some iniquitous trust of this sort is not springing into existence. What do you want to investigate? You might as well investigate as to whether larceny, or highway robbery, or bribery is a benefit or a detriment to the people. They have never hesitated to buy Legislatures and courts whenever the occasion required it and the opportunity presented itself. I point to the history of the Standard Oil company and all the other trusts that are now following in its track and emulating its example. The wealth of this monopoly to-day is one hundred and fifty millions and still growing. The profit of last year was twenty-five millions of dollars. It started with less than a million dollars. How did it acquire the one hundred and forty-nine millions? By a system of highway robbery and crime such as no civilized country ought to tolerate. Individual enterprise, honest competition, transportation lines, refineries and pipe lines were all trampled to death under its merciless march to aggrandizement.

"Look at the sugar trust to-day. Do you want to investigate that? Summon the Havemeyers with their books. Ask them two questions; first, what was the value of their plant when they went into the trust; second, what are the profits they are receiving out of it? Why, the total plant of all the refineries only amounted to sixteen millions. To-day it is sixty millions. And then when you are done with the Standard company and the cotton seed oil trust and the sugar trust, take up the rubber trust, with a capital of fifty millions of dollars, and then take up the lead trust and the linseed oil trust and the slate trust, the oil cloth, salt, steel and scores of other trusts and combines organizing daily with all the speed they can in order to anticipate any action of Congress in the premises. The country is looking to Congress for relief. Realize the magnitude of the subject and listen to the voice of a suffering people resounding through the homes and business centres of this country and through the medium of an enlightened press appealing to their representatives to rescue them from the clutches of the most dangerous monopolies that have ever raised their forms upon our soil. A majority of both houses of Congress are favorable to action and are impatient to get the subject in shape to give it prompt and effective concurrence."—*Daily Oil News.*

Natural Gas as an Illuminator.

It has been asserted by a good many people, who do not know, that natural gas can not be used for illuminating purposes, without "working it over." The contrary has been known to be true in the gas fields, but the light resulting has been unsatisfactory, because it gives too much heat and because the light is wavering—due to the volatile nature of the gas. A number of devices have been perfected by which natural gas can be converted rapidly and at comparatively small cost into an illuminating gas. One of these has been undergoing trial in this city, and the experiments have proved successful. The process has been subjected to tests at the hands of chemists, and has been given a scientific standing.

The principle claimed for the apparatus is that by means of hydro-carbonates the natural gas is enriched so that its candle power is greatly increased, while there is a corresponding diminution of units of heat. A metal box not unlike a gas meter in appearance is the receptacle of the hydro-carbonates. It is called a "carbonater." In it are sponges, which soak up the fluid. The gas passes in juxtaposition to the fluid, and by capillary attraction is enriched from the hydro-carbonates.

Either manufactured or natural gas is improved by this process. The gas which is supplied to the city is increased in illuminating power 300 per cent. by this means. In other words a burner which produces light of seven candle power is increased to twenty-one candles. Practical demonstration was given last night to this effect at the Denison House. At the residence of Mr. John Pearson, corner of Fourteenth street and Meridian, the enricher is in practical use daily. The house is lighted throughout (as well as heated) with natural gas. One burner gives out fully as much light as two burners of the illuminating gas with which the city is now supplied. The lights, tested side by side, justify this assertion. Passing natural gas through the fluid and permitting it to blaze side by side with the gas in its native condition, a vast increase in its illuminating power is discerned. It is claimed for the device that it not only increases the illuminating power of the gas but that it diminishes by fully 15 per cent. the amount consumed.

Illuminating gas at present costs $1.80 per 1,000 feet. Natural gas can be enriched and converted into a better illuminant at from 40 to 75 cents ger 1,000 feet.—*Indianapolis News.*

Craig-Mitchell.

The marriage of Mr. Joseph W. Craig, the well-known young oil prince of Pittsburg, to Miss Ida Mitchell, the second daughter of Mr. and Mrs. Minott Mitchell, took place at the home of the bride's parents at White Plains, N. Y., on the evening of Feb. 8. The wedding was a quiet one, attended only by near relatives and a few intimate friends. Mr. Arthur Lowrie, of Pittsburg, acted as "best man," and Miss Maud Mitchell, sister of the bride, was maid of honor. The ushers were Messrs. W. C. Lowrie, Pittsburg, George and Percy Craig, Allegheny City and George Gebbe, of New York. The bride and groom started soon after the ceremony on their bridal tour, which will include a short stay in Florida, a trip to San Francisco and a tour of Europe.

Mr. Craig, who is about 28 years old, has been so prominently identified with the oil business during the past four years, that he needs no introduction to oil country readers. He became interested in the brokerage firm of J. C. Fisher & Co. in 1884 and was soon the principal figure in it. His success was remarkable. His failure a little less than two years ago is well remembered, as well as his successes since then, which have fully retrieved the losses made at that time.

The bride is spoken of by those who know her as a very attractive young lady and a member of one of the oldest families of West Chester county, N. Y., she being related to Chauncey M. Depew and William M. Evarts. Her father, Minot Mitchell, is a well-known member of the Consolidated Stock and Petroleum Exchange, having been a director of that institution since its organization. The couple will probably make Pittsburg their home.

Condition of Canonsburg Wells.

The following table showing the condition of the wells drilling for oil in the Canonsburg field Feb. 10, is from the *Herald:*

Property.	*Owner.*	*Condition.*
Reform School No. 1,	Wm. Flinn	200
"	No. 2, Wm. Flinn	rig
"	No. 3, Wm. Flinn	rig bldg
"	No. 4, Wm. Flinn	rig bldg
"	No. 5, Wm. Flinn	located
Giffin No. 2,	John McKeown	rig
" No. 3,	John McKeown	rig bldg
Gladden No. 1,	Canonsburg L. & F. Co.	rig
McNamara No. 1,	Fisher Bros.	rig
Douglass No. 1,	Mnfrs.' N. G. Co.	rig bld
WILDCATS.		
McPherson,	John Snee	200
Scott,	Philadelphia N. G. Co.	1200

COAL OIL JOHNNY.

SOME YARNS ABOUT THE FAMOUS AND PRODIGAL OIL PRINCE.

STORIES of "Coal Oil Johnny" have not been nearly so numerous of late years as they were at one time. Formerly they appeared about once a month. As Mr. Steele is now a good, industrious citizen of the boundless West, and has not been indulging in any wild revels lately, it will do no harm to reproduce the following Minneapolis correspondence:

"Yes, I have traveled some. I've been around the world three times," said John W. Gaylord, the well-known minstrel. "And I have had many queer experiences. Do you know Coal Oil Johnny was my particular friend in his palmiest days? Well, he was. Indeed, I was his room mate when he cut his antics which made him celebrated as the most eccentric millionaire on earth. It was from 1863 to 1869. You see I was with the Skiff & Gaylord minstrels. Johnny, whose real name is John W. Steel, saw our performance in Philadelphia, and he got stuck on the business and bought a third interest in the show. His first move was to get $5,000 worth of wood cuts at his own expense. They were all the way from a one-sheet to a twenty-four-sheet in size, and the largest amount any concern had ever owned. The cartoon, which attracted so much attention, of 'Bring That Skiff Over Here,' was in the lot. We went on the road, did a monstrous business everywhere, turned people away, and were prosperous.

"Reaching Utica, N. Y., Johnny treated to a supper for the company, which cost $1,000. He then conceived the idea of traveling by his own train, and purchased an engine, a sleeper and a baggage car at an enormous expense. All dates for two weeks were cancelled and we went junketing, Johnny footing all bills. In Erie we had a $500 supper, and so it went. It was here that Johnny bought his first hack. After a short ride he presented it to the driver. Our dates being cancelled, Johnny insisted upon indemnifying us for the loss of time. He paid all salaries and then estimated the probable business receipts upon the basis of packed houses, and paid that large sum over to Seth Slocum, our treasurer.

"In Chicago Johnny gave another exhibition of his eccentric traits. He leased the Academy of Music for the season, and we did a big business. Finally he proposed a benefit for Skiff & Gaylord, and sent over to rent the Crosby Opera House, then the first in the country. The manager sent back this insolent reply to the overture: 'We won't rent our house for a —— nigger show.' Johnny got warm in the collar. He went down to their office in Root & Cady's music store.

"'What will you take for your house and sell it outright?' asked Johnny of Mr. Root.

"'I don't wan't to sell,' said he.

"'I'll give you a liberal price. Money is no object.'

"Then Johnny pulled out his roll from his valise and counted out $200,000, and asked Root if that was an object. Mr. Root was thunder struck. 'If you are that kind of a man you can have the house for the benefit free of charge.' Well, the benefit was the biggest success ever known in minstrelsy. The receipts were $1,500, and more were turned away than could be given admission. Next day Johnny hunted up one of the finest carriage horses in the city and presented it to Mr. Root in recognition of the courtesy extended.

"Oh, Johnny was a prince with his money. His income at that time was $15,000 a day, but I have seen him spend as high as $160,000 in one day. That was the time he hired the Continental hotel in Philadelphia and bought the Girard House. You have doubtless heard of the circumstances. It came about in this way: We went to the Continental, and Johnny very politely said to the clerk: 'Will you please tell the proprietor that J. W. Steele wishes to see him?' 'No, sir,' said the clerk; 'the landlord is busy.' Johnny suggested that he could make it an object in a financial way for the Clerk to accommodate the whim. At this the clerk became disdainful, and Johnny tossed a bell boy a $20 gold piece with a like request. The result was an interview with the landlord forthwith. Johnny claimed that he had been ill treated and requested the summary dismissal of the clerk. The proprietor refused, and then Johnny asked the price of the hotel, offering to buy it. The man said he could not sell, because he was not the entire owner.

"'Will you lease it for to-day, then?' asked Johnny.

"'No.'

"'Suppose I give you $8,000 for the privilege.'

"'Well, that alters matters somewhat.'

"A bargain was made, the $8,000 was paid over, and Johnny was installed as landlord. He made me bell boy, while Slocum officiated as clerk. The doors were thrown open, and every guest in the house had his fill of wines and edibles free of cost. In fact a huge placard was posted in front of the hotel, which read: 'Open house to-day; everything free; all are welcome!' Oh, it was a merry lark. The whole city seemed to catch on and the house was full. When Johnny thought he had fun enough he turned the hostlery over to the landlord, who at once reinstated the odious clerk. Here was a howdedo. Johnny was frantic with rage. He went over to the Girard and quickly concluded a bargain for it, the consideration being $110,000. It was placed in charge of the old proprietor with instructions to 'buck' the Continental by making the prices so low that everybody would come there. This was done, and the Continental did no business so long as the arrangement continued.

The day of the hotel transaction we were up on Arch street. A rain set in and Johnny approached a hack standing in front of a fashionable store and tried to engage it to carry us up to the Girard. The driver said it was impossible, as he had a party in the store. Johnny tossed him a $500 bill and he said he would risk it. When we arrived at the hotel Johnny said: 'See here, Cabby, you're a likely fellow. How would you like to own that rig?' The driver thought he was joking, but Johnny handed him $2,000 and a half hour later the delighted driver returned with the statement that the purchase had been effected for the $2,000. Johnny then gave him $1,000 to buy a stable with, and that man to-day is the wealthiest hack owner in Philadelphia. It was about 1866 that Johnny went broke, poor fellow. All this talk about his lighting cigars with $100 bills is nonsense. He was a spendthrift, but he usually spent his money where he thougt it would benefit some one."

Record of the Carmi Well.

Among those who hastened to Carmi, Ill., to investigate the report that oil had been struck there was T. H. Nicholson, of Oil City. He was one of the first to denounce the hoax, and on his return gave to the Oil City *Blizzard* the following information regarding the well being drilled at Carmi by the Knights of Labor to test that section for coal and which is being put down with a diamond drill. The drill cuts the rock out in round pieces, about two and one-fourth inches in diameter. These cores are pulled out of the well in sections about twelve feet in length and furnish excellent samples of the different strata through which the drill passes.

Following is the record of the well under discussion, as correctly as it could be obtained:

34 feet clay shale with small boulders in it.
4 feet clay shale, soapstone.
3 feet sandstone.
3 feet bluish gray shale.
8 inches coal.
8 feet bluish colored fire clay (gritty).
4 feet hard gray sandstone.
2 feet fossiliferous limestone (very hard).
20 feet clay shale mixed with sandy shale.
45 feet hard sandstone.
3 feet slate "black."
28 inches coal.
12 feet fire clay and shale (clay gritty).
80 feet of shale of different kinds and colors, interspersed with bands of soft sandstone.
80 feet sandy and micaceous shale with seams of clay.
40 feet hard micaceeous sandstone streaked with black bands.
3 feet greenish black slate.
18 inches fine coal, very hard.
6 feet fire clay.
90 feet green and bue shale.
5 feet four inches hard limestone.
3 feet black slate.
8 inches coal.
8 feet fire clay.
268 feet hard, sandy and micaceous shale, with bands of fine sandstone. The last 12 feet was hard, close-grained sandstone, with fine grit.

The 34 feet on top of section is added to the bore to bring the section up to the level of the town, the drilling being done in a ravine.

The well is being put down by the Knights of Labor, for the purpose of testing for coal.

THE MORRISVILLE WELL.

SECTION OF THE LOWER DEVONIAN AND UPPER SILURIAN IN CENTRAL NEW YORK.

(Read before the American Association for the Advancement of Science, by Charles S. Prosser, Cornell University, Ithaca, N. Y.

A WELL was drilled for natural gas at Morrisville, Madison county, New York, to the depth of 1,889 feet. Altitude of the well's mouth is probably more than 1,200 feet A. T.

The well commences in the lower half of the Hamilton, and then passes through the Marcellus shale; corniferous limestone; Oriskany sandstone; Lower Helderberg limestones; limestones, marls and shales of the Salina; Niagara(?) and ends in the upper Clinton.

The united thickness of the Corniferous, Oriskany and Lower Helderberg is 279 feet, of which 186 feet is probably Lower Helderberg. The Salina of this section

consists of 325 feet of hydraulic limestone, 590 feet of shales, impure limestone and marls, closing with 225 feet of red shale. Total thickness of Salina, 1,140 feet. At 1,805 feet is a blue, argillaceous shale which may be Niagara.

Gas was obtained at 578 feet and in smaller amount at 755 feet, but not in quantity enough to be of economic value. A stratum of rock salt, 10-12 feet thick, was reached at 1,259 feet in the upper part of red and green variegated marls. Samples from 1,805 and 1,815 feet show traces of salt.

I am indebted to Mr. W. W. Hague for the specimens illustrating this section, and also to Mr. E. M. Hague and Capt. H. H. Cumings for additional information.

The accompanying section gives the most important facts of the well.

Depth	Thickness		
Feet.	Feet.		
			Hamilton.
340			Marcellus, first sample.
371			Corniferous limestone.
			441 (?) Horizon of Oriskany sandstone.
	79		
578			Gas. Lower Helderberg limestone.
	2		
650			
	5		
755			Gas.
	32		Hydraulic limestone.
975		SALINA.	Light gray shale.
1018			5 ft. of dark red shale.
	87		Green and blue marls.
1110			
1179			
	36		Limestone ?
1215			
1259			10-12 ft. of rock salt.
	141		Red and green variegated marls.
1400			
	60		Red marl.
1460			
	105		Green and blue marls.
1565		1140	
	225		Red Shale.
1790			
1805			Blue shale and Limestone. } Niagara ?
1849			25 ft. blue shale.
	25		
1874			Blue shale and Limestone. } Clinton.
1889			

Pittsburg Gas Shares.

Since the pooling arrangement was entered into between the Philadelphia company and the Chartiers Natural Gas company, the stock of the Philadelphia company has advanced considerably above par. The dividend of one per cent. a month is steadily maintained and gas share brokers expect to see the stock go higher than ever before, the previous limit being $65 at the time the Drexel & Morgan syndicate was marketing the last treasury stock.

The shares of the Chartiers company have advanced only slightly as yet, but are beginning to show sympathy with the movement in Philadelphia shares, so that it is expected the regular treasury stock of the company may soon be disposed of at par. This same treasury stock is, perhaps, the principal bear feature in considering Chartiers Gas, but a spirit of speculation once aroused will not hesitate long at swallowing the new stock and going forward with the booming operation. Brokers say the principal demand for these stocks at present is outside of Pittsburg, local investors being pretty well loaded with them.

The Old Parker Exchange.

A writer in the Pittsburg *Post* says: "The sale of the Parker City Oil Exchange by the constable for ground rent at the suit of Mrs. Ella Spain, as already noted in the *Post*, revives some interesting reminiscences of that once famous oil town. When the Butler and Armstrong fields were at their height Parker City was the metropolis of the oil country. A very large part of the speculative business was done there by some of the most prominent men in the trade, who either lived there at that time or had representatives on the floor of the exchange. T. B. Simpson was then a big operator in the Parker Exchange. Dan Goettell was represented by George Darr. Perhaps two dozen of the most prominent men in the speculative trade were there. Trading was done on a large scale. The exchange had a library that cost $5,000 and pictures valued at nearly as much. Parker City was the liveliest town in the oil country. Hotels and boarding houses were packed from cellar to garret. The strip of bottom land along the Allegheny, upon which the town was built was not half large enough to accommodate the rapidly growing population, and the hilltop was soughr fot building room. A high bluff in the rear of the town was overcome by putting in a perpendicular elevator which gave easy and rapid transit to the town on the summit. Dunc Karns was then a prominent figure about Parker City. He had made a big fortune in oil, and he and some other wealthy citizens built the Parker and Karns City railroad, about 12 miles in length. It traversed the Bear Creek hills, probably the widest territory in the State. It ran dozens of trains daily and could not accommodate the great tide of travel that sought the bonanza oil fields of Armstrong and Butler counties. This road is now a part of the Pittsburg & Western system. With the decline of the oil fields around Parker the town began to fall into decay, and in it the history of Pithole is nearly repeated. It has been several times wiped out by fire, and little of the once famous oil metropolis now remains. The $5,000 library that was the property of the oil exchange was sold for $1,200 some years ago and removed to Oil City.

A ROUSING gas well is reported from Palo Pinto county, Texas. The gas was struck at a depth of 380 feet and it is said the roar of the escaping vapor can be heard a mile away.

January Production Report.

Reports of the stocks at wells in the Bradford field received by THE PETROLEUM AGE show an increase of 1.15 barrels to the well during the month of January. Stocks reported at wells in the Allegany field show a like increase of 3.1 barrels per well. The total number of wells connected with the pipe lines in the Bradford field on December 1 was estimated at 14,100, and the number in the Allegany field 4,000. From the above data it is found that the average daily increase in stocks in the Bradford field was 523 barrels. In the Allegany field it is found by the same computation that the stocks at the 4,000 wells increased 400 barrels per day. The average daily pipe line runs from the Bradford field were 11,329 barrels, and from the Allegany field 2,620 barrels. Adding the daily increase in stocks to the pipe line runs the figures are tabulated as follows:

January daily average Bradford runs	11,329
" " " Allegany "	2,620
Total runs both fields	13,949
Increase Bradford stocks	523
" Allegany "	400
Daily increase both fields	923
January's estimated daily production Bradford and Allegany fields	14,972
December's estimated daily production Bradford and Allegany field	15,070
Daily decrease in January	98

DECEMBER PRODUCTION REPORT.

Reports of the stocks at wells in the Bradford field received by THE PETROLEUM AGE show a decrease of 2.8 barrels to the well during the month of December. Stocks reported at wells in the Allegany field show a like decrease of 1.97 barrels per well. The total number of wells connected with the pipe lines in the Bradford field on December 1, was estimated at 14,100 and the number in Allegany field 4,000. From the above data it is found that the average daily decrease in stocks in the Bradford field was 1,273 barrels. In the Allegany field it is ascertained by the same computations that the stocks at the 4,000 wells decreased 254 barrels per day. The average daily pipe line runs from the Bradford field were 13,292 barrels and from the Allegany field 3,305 barrels. Subtracting the daily decrease in stocks from the pipe line runs the figures are tabulated as follows:

December daily average Bradford runs	13,292
" " " Allegany "	3,305
Total runs both fields	16,597
Decrease Bradford stocks	1,273
" Allegany "	254
Daily decrease both fields	1,527
December's estimated daily production Bradford and Allegany fields	15,070
November's estimated daily production Bradford and Allegany fields	16,780
Decrease in December	1,710

WARREN, FOREST AND LOWER COUNTRY.

Reports were received from groups of wells in the different sections of Warren, Forest and the Lower Country. The number of wells on the 1st of each month, with their averages, are contained in the following statement:

	No. wells Jan 1	*No. wells Feb 1*	*Av. per well Jan 1*	*Av. per well Feb 1*
Clarendon and Tiona	75	75	23	24
Cooper District	172	147	34	31
Lower Country	173	172	41	38
Miscellaneous	22	22	12	11

As Macksburg oil is used in the same way as that of the fields of New York and Pennsylvania, there is no good reason why the Macksburg runs should not be

counted in the runs of the oil regions. Hence they are included in the outside runs for November and December in making the following estimates on production:

Field.	December. Barrels.	January. Barrels.
Bradford and Allegany	15,070	14,972
Outside Runs, including Macksburg	25,320	22,751
Total	40,390	37,723
Decrease	2,667	

Compared with the month of January, 1887, there is a decrease of 26,706 barrels. The average daily production for the month of December, 1886, including the Macksburg field, was 64,429 barrels.

In the above estimates no account is taken of the "dump oil" loaded on the cars direct from the wells at Emlenton and other points in the region. The Lima runs by the Buckeye pipe lines were 11,081 barrels a day in January.

The following table shows the comparative production of the New York, Pennsylvania and Macksburg, O., oil fields for 1886, 1887 and 1888:

	1888.	1887.
January	37,723	64,429
	1887.	1886.
January	64,429	57,272
February	63,724	57,840
March	63,392	59,764
April	63,447	63,027
May	63,253	68,198
June	62,275	74,454
July	60,005	73,887
August	59,121	76,657
September	60,145	78,228
October	58,942	77,009
November	42,414	72,695
December	40,390	67,790
Total	701,537	826,821

The Origin of Rock Oil.

At the annual meeting of the Chemists' Association held in Liverpool last month, the president, W. H. Samuel, in his annual address discussed the origin of petroleum, substantially as follows:

He fully explained the most important theories to account for its formation in the earth, which, he said, were known as the organic and inorganic theories. The former theory considered that petroleum was the result of the slow natuarl distillation of organic matter, both animal and vegetable, that had been deposited in strata of former epochs of the earth's history, chiefly those of the Silurian and Tertiary periods. The latter, or inorganic theory, traced the origin of petroleum from the direct incuence of carbonic acid and water, which infiltrate the earth's crust, on metals—such as iron, etc.—far down in the interior of the earth. He stated that it had been frequently asserted that at no very distant date the world's petroleum supplies would be exhausted, and therefore the question of its original formation has an imporportant bearing, as, if the organic theory be the accepted one, the generation of petroleum has been practically completed. If, on the contrary, the inorganic theory be the true one, we have conditions which are perpetually renewed and continuous, and at present active. In conclusion, he stated that the rise and progress of the petroleum industry had been the most remarkable and rapid of any branch of commerce of modern times, and it had exercised a marked influence on modern civilization. To recount the uses to which it is now applied was not within the scope of the paper. It was sufficient to say that, as the cheapest and one of the most brilliant illuminants yet discovered, it had added largely to social comfort and happiness. It has enabled poor work-people to considerably extend their hours of labor, thereby increasing their power of wage earning. It was rapidly displacing all other illuminants. As a lubricant, it had superior qualities to all animal or vegetable oils, owing to its freedom from oxygen, as well as its cheapness in comparison with these oils. Its use as the cheapest of fuels was of the first importgnce, although we might say it was as yet in its infancy for that purpose; but that it would ultimately largely displace coal in the merchant and naval marine of all nations was, in his opinion, certain.

Oil and Gas Notes.

The Indianapolis Consumers' Trust has completed 2 new gas wells, giving it a total of 12.

The oil country has been fruitful of novel expedients and ideas of progress. Its great shut down is one of these in that it offers a solution of the labor problem by taking a long stride towards a species of co-operation worthy of emulation in other industries and the trades.

Batavia, O., has organized a gas company and and will begin drilling a test well at once.

The Waterloo Mining and Gas Company, of Waterloo, Ind., is one of the latest additions to the list of gas companies.

The well of the Spencerville, O., gas company, which struck oil instead of gas, proves finally to be a failure for all purposes and has been abandoned.

Another gas well is being drilled at Erie. It is located at what is known as the Head and though situated on the low sand ridge between the lake and the stream which empties into the bay at its extreme western end, it found no water. Gas was struck in small quantity at 105 feet, but drilling is still going forward in hope of getting more lower down.

About 400 citizens of Allentown, otherwise the Thirty-first ward, Pittsburg, met and protested against the advance in rates proposed by the Philadelphia company, and adopted the following:

Resolved, That we pledge ourselves not to renew any contracts for the use of natural gas by which we will be charged more than we are paying at present, and that all quit the use of gas if no compromise in price can be effected.

Work has been resumed on the test well drilling at Linesville, Crawford county, which was shut down by reason of the fact that the bull wheels "ran away" some time ago and ascended the derrick to the detriment of girths and braces.

The tools have been recovered from the Johnson & Hamilton well at Nineveh, Greene county, about four barrels of oil sand pumped out of it, a plank spiked over the hole, on which the tools rest, and the bonus paid on some leases several miles to the northward, all of which signs induce the natives to believe the well is a gusher. The signs look more like those of bu'sted hopes and buried dollars.

The exports of petroleum, crude equivalent, as reported by *Bradstreet's* for the week ending February 4, were 9,171,286 gallons. From January 1 to February 4, 1888, they were 45,525,586 gallons as compared with 56,550.908 gallons for the same period last year, showing a decrease of 11,025,322 gallons. The official statement of the Treasury department for January gives the exports of petroleum and products at 35,425,358 gallons, as compared with 47,535,551 gallons in January, 1887, a decrease of 12,110,193 gallons.

Application has been made to the court at Washington, Pa., to allow the Directors of the Poor to contract with the People's Light and Heat company to drill for oil or gas on the county farm.

The Indianapolis Citizens' Gas Trust has purchased its pipe. It will start at the wells with a 12-inch main, but this will be increased to 16 inches after the first mile. Certain streets will be occupied by 10 and 12-inch high pressure mains, laid around squares embracing 4 to 6 blocks.

A rig has been erected on the Edward George farm, near Greensburg, by the Pine Run Gas Co., preparatory to drilling a new well,

A gas well on the Alex Sproul farm in Westmoreland county showed some oil and Mr. Sproul torpedoed it. It has since sprayed some oil which makes a big showing on the surface of a pool near by.

There are two wells under way in the Pleasantville district. Gradually those who do unto others as they would not be done by, to use a classic phrase of the time, take a tumble to themselves and try to be decent.

The Petrolea, Ont., crude market still hangs about in the lower seventies. They have no shut-down over in Canada.

On information of William Wilson, a contractor, the Claysville Light and Heat Company was fined $200 by a Washington, Pa., justice for not plugging an abandoned well according to law.

Carmel, Ind., has struck gas. When lighted the blaze was fifty feet high.

The use of natural gas at the Tile Works is more than successful. Specimens of work made by the new method are being distributed and are pronounced superior to tiles produced by the old way of baking. The colors appear more distinct and the designs much plainer than formerly. The time of burning has been reduced. It used to take thirty hours to complete the burning, but with gas in the kilns the time is reduced to twenty-four.—*Indianapolis News.*

Alleged Reasoning About Exports.

The *Oil, Paint & Drug Reporter*, a member of the Standard monopoly's literary bureau, has been bearing for some time. It has endeavored in every way to find a bear argument in face of the restrictive movement in the producing region, and of course it pins its faith to Russia, as all the bears do in their hour of need. In an elaborate, argumentative editorial in the current issue, it calls attention to the decrease of 12,110,193 gallons in the exports of January as compared with last year. To give its argument an appearance of fairness it says: "As the difference in the exports of one month as compared with another may not be of much importance, by reason of special causes, we look further and find that, comparing the exports covering the period from July 1 last to the end of January, with the corresponding period of the year previous, there is a decrease in the total exports of 7,183,747 gallons." This it declares is proof conclusive that something is wrong with our exports.

Suppose we look at this logic. Special causes, of temporary effect, may have led to a decrease of 12,000,000 gallons in

January; the decrease for seven months is 7,000,000 gallons, and this must be permanent; 7,000,000 from 12,000,000 leaves 5,000,000. A temporary decrease in one month, overcomes an increase in six months; therefore, there is a permanent decrease. It is not probable that any sane man will call this reason. The fact is that January shows an adverse balance. But the last six months of last year showed a favorable balance, and the whole of last year as compared with 1886 showed a favorable balance. A long line of years have shown a progressive increase, each year over the preceding one, and the probability is that 1888 will get around in line all right before December 31. Special causes led to an extra-active movement December last and the removal of that cause by the fluctuation of the crude market caused a holding off decrease in January, with depletion of stocks at all foreign ports. If we were actually losing ground it would hardly be necessary for anyone to employ sophistry like that quoted above to call attention to the fact.

The Refined Markets.

The heavy export movement noted in our report for December was discontinued early in January. exporters refusing to buy at the advanced quotations of New York, Philadelphia and Baltimore. The closing quotation for December was 7½c per gallon, but owing to the rapid advance in the crude market the opening quotation for refined in January was 7⅝c per gallon, and this was followed on the 9th by an advance to 7¾c, which figure was maintained to the close of the month. Stocks in foreign ports were low at the beginning of December, and were being rapidly reduced by deliveries to the interior. In view of the probable effect of the shut-down movement in the crude producing regions, exporters placed large orders with the purpose of increasing their stocks abroad before any material advance should take place. Dealers in the interior also became alarmed and increased their orders. When the crude market boomed so rapidly toward the dollar line early in January these dealers became clamorous, and in view of the light stocks on hand and the withdrawal of American orders for export to supply the demand, prices were forced up rapidly.

The opening prices in the principal foreign markets for January were: London, 6½@6¾d; Bremen, 7.35m, and Antwerp, 18½f. The flurry culminated on the 20th, when the quotations were: London, 9½d; Bremen, 8.85m; Antwerp, 24f. About this time the large quanties of oil bought and loaded in December began to arrive in port, the crude market was weak and the foreign refined boom collapsed quite rapidly.

The export movement for January was very light and showed a decrease of 12,710,000 gallons as compared with January of last year. But stocks in the foreign ports will reach a minimum by next month and an export movement of considerable proportions may be looked for by March or April. A New York writer at the close of January had this to say:

Refined in barrels for export has received but little attention the past week, the market being unusually dull for this season of the year. Shippers have been looking for a reaction in their favor owing to the lower range of prices ruling in the speculative market for certificates, and have held their orders in abeyance. So far they have been disappointed, but nevertheless the markets abroad have steadily declined.

The sales reported fall short of 50,000 barrels. The price of 70 deg. Abel test has remained steady at 7¾c for all loadings, and at present no indications of a change are discernable. The principal foreign markets are lower, quotations by cable this afternoon being: Bremen, 6.60m; Antwerp, 18⅝@18¾; London and Liverpool, 6⅝@7⅜d. Freight rates show little change, though vessels are not so plentiful, and the rate of 2s 3d hence to London and 2s 3d@3s 6d to Continental ports, as to port, still holds good. Home trade lots have been in somewhat better request and rule steady at our quotations. We quote 8⅝@8¾ for State legal tests; 8@8⅛c for 110 test; 8¼@8⅜c for New York city 100 deg. flash, and 8¾@9c for 150 deg. water white. Western lots are held fully up to these figures.

Cases for export have received little attention, the total sales reported amounting to only about 100,000. The price has remained steady at 9¾c for plain tops. Freight rates are firmer, owing to a comparative scarcity of vessels. The rates for large vessels are: For Java, 30@31c; Japan, 27@28c; Calcutta, 20@21c; Bombay, 19c; Rangoon, 20c; Singapore, 22½@23c; Hong Kong, 21@22c, and for Shanghai 29@30c.

Crude in barrels for export has continued in light request and only a few small sales are reported. Prices have been steady to 6⅞@7⅛c, for Bradford and Parker respectively. Cases for export have also been in light request, and sales of only 25,000 are reported. Prices are unchanged at 8⅞@9⅛c.

Prime city naphtha has remained steady at 7c. For export there has been no demand and no sales are reported.

Western residuum, 42@51 deg. test, is quoted at 1½@1¾c f o b. Barrels are quoted at 5@5½. No sales are reported for export.

William H. Samuel & Co., of Liverpool, England, report the visible supply of refined petroleum on Jan. 1 as follows:

	Barrels.
Europe (7 Continental ports)	985,319
London	186,719
Liverpool	110,500
Total	1,282,538
Total Dec. 1	1,620,158
Decrease	337,620

The same parties, under that date, say of the present position and future outlook:

The deliveries from the seven principal Continental ports, for the year 1887, show an increase over 1886 of one-fifth of 1 per cent. For the last six months of 1887 the increase over the like period of 1886 was 1 per cent. Deliveries from London increased 8½ per cent. for the year and 17 per cent. for the last six months. From Liverpool the increase for the year was 17 per cent. and for the last six months at the same rate.

With an exceptionally low stock of refined oil, our market opened in January at 7¼d for favorite brands, advancing before the middle of the month to 7½d, and then declining owing to arrivals to 7⅜d, and with further arrivals at the end of the month to 7d. The supply, however, continued small until the end of March, and this price was firmly maintained until early April, when the market gave way and declined to 5⅞d, remaining thereat with slight variation until early May, when a further fall to 5¾d followed, and at this the market remained almost stationary for four months. The improvement in the American markets which set in in August soon reacted upon Liverpool and other home markets, and in September prices advanced here to 5 15-16d, declining again before the end of the month to 5⅞d. From the middle of October, however, when an upward movement, starting at 5 15-16d, was commenced, prices continued steadily to advance to the end of the year, 6¼d being reached at end of October, 6⅝d during the latter half of November, 6½d early in December, and 7d at the close of the month. Russian oil during the year has ruled at from ½d to 1d per gallon below these prices.

Mr. Geo. H. Lincoln's monthly circular gives the following figures on the clearances of refined petroleum, in cases, for China and the East up to the 31st of January for the years 1887 and 1888:

	1888 Cases	1887 Cases
China	117,820	171,929
Japan	4,528	148,839
India	47,300	169,210
Java, Signapore, etc	167,539	96,243
Total January 31	337,187	586,221

REFINED QUOTATIONS FOR JANUARY.

	New York	Philadelphia	Baltimore	Liverpool	London	Bremen	Antwerp
	Cts.	Cts.	Cts.	Pence		Reichmarks.	Francs
1							
2							
3	7⅝	7⅝	7⅝		6½@6¾	7.35	18⅛
4	7⅝	7⅝	7⅝		6½@7¼	7.50	18½
5	7⅝	7⅝	7⅝		7¼	7.65	18¾
6	7⅝	7⅝	7⅝	6 13-16	@7½	7.75	18¾@19
7	7⅝	7⅝	7⅝		7¼	7.75	19
8							
9	7¾	7¾	7¾	6 11-16	@7¼	7.75	19⅛
10	7¾	7¾	7¾	6 11-16	@7¼	7.75	19⅛
11	7¾	7¾	7¾		6¾@7½	7.85	19⅛
12	7¾	7¾	7¾		6¾@7½	7.95	19⅛
13	7¾	7¾	7¾		8 @9	8.05	19⅛
14	7¾	7¾	7¾		8 @9	8.05	19⅛
15							
16	7¾	7¾	7¾		7¾@9	8.05	20¼
17	7¾	7¾	7¾		9	8.35	21
18	7¾	7¾	7¾		9	8.40	20
19	7¾	7¾	7¾		8½@9½	8.40	20
20	7¾	7¾	7¾		9½	8.85	24
21	7¾	7¾	7¾		9½	8.85	24
22							
23	7¾	7¾	7¾		9½@8⅛	8.85	20⅛
24	7¾	7¾	7¾		8 @6⅞	8.25	20⅛
25	7¾	7¾	7¾		6⅞@8⅜	8.00	18¾@19
26	7¾	7¾	7¾		8⅜	7.85	18⅝@18¾
27	7¾	7¾	7¾		8 @6⅜	7.60	18⅝@18¾
28	7¾	7¾	7¾		6⅜@7⅜	7.60	18⅝@18¾
29							
30	7¾	7¾	7¾		6⅝@7⅜	7.60	18⅝@18¾
31	7¾	7¾	7¾		6⅝@7⅜	7.60	18⅝@18¾

The Crude Market.

The market for crude oil certifitates was active and exciting during a large part of January. The upward movement, started near the close of December by the covering of shorts, culminated on the second business day of January, and a sharp reaction followed. For some time after this the daily fluctuations were wide and violent, but toward the close of the month the market grew quieter and steadier. The opening price was 90c and the highest point, which was reached on the 4th, was 98c. On the 17th the lowest price was reached at 85c, the closing quotation being 90½c. The average price for the month was 91 7-16c, and the fluctuation 13c.

Exchanges.	January.	December.
Bradford	58,572,000	43,778,000
Oil City	88,136,000	52,354,000
New York	188,344,000	139,446,000
Pittsburg	104,731,000	82,674,000
Total	439,783,000	318,252,000

Pipe Line Summaries.

Following is a comparison of the figures of the National Transit and Tidewater pipe lines for December and January:

NATIONAL TRANSIT CO.

	Barrels.
Acceptances, etc., Dec. 31	19,212,036.33
" " Jan. 31	18,465,036.33
Decrease	747,000.00
Credit balances Dec. 31	6,938,701.36
" " Jan. 31	6,693,151.21
Decrease	245,550.15
Total liabilities Dec. 31	26,150,737.69
" " Jan. 31	25,158,187.54
Decrease	992,550.15
Gross stocks Dec. 31	29,410,666.53
" " Jan. 31	28,339,619.09
Decrease	1,071,047.44
Sediment and surplus Dec. 31	3,259,928.84
" " Jan. 31	3,181,431.55
Decrease	78,497.29
Receipts from all sources Dec.	1,287,015.27
" " " January	1,043,155.84
Decrease	243,859.43
Total deliveries December	2,208,289.47
" " January	2,032,068.82
Decrease	176,220.65
Runs from wells December	919,953.65
" " " January	803,536.82
Decrease	116,416.83
Regular shipments December	2,179,410.27
" " January	1,981,581.23
Decrease	197,829.04

The total receipts of the Transit Company for January were made up as follows:

Runs from wells	803,536.82
Received from other lines	239,619.02
Total	1,043,155.23

The deliveries for January were made up as follows:

Regular shipments	1,981,581.23
Delivered to others lines	50,487.59
Total	2,032,068.82

TIDEWATER PIPE CO.

Acceptances, etc., Dec. 31	627,000.00
" " Jan. 31	634,000.00
Increase	7,000.00
Credit balances Dec. 31	654,531.22
" " Jan. 31	635,683.26
Decrease	18,847.96
Total liabilities Dec. 31	1,281,531.22
" " Jan. 31	1,269,083.26
Decrease	12,447.96
Gross stocks Dec. 31	1,435,028.79
" " Jan. 31	1,420,703.29
Decrease	14,325.50
Sediment and surplus Dec. 31	153,497.57
" " Jan. 31	151,020.03
Decrease	2,477.54
Receipts from all sources December.	145,865.99
" " " January	147,146.13
Increase	1,280.14
Total deliveries December	300,459.16
" " January	155,522.15
Decrease	144,937.01
Runs from wells December	116,986.79
" " " January	96,658.54
Decrease	20,328.25

The above receipts for January were made up as follows:

Runs from wells	96,658.54
Received from other lines	50,487.59
Total	147,146,13

Uncertainty of Clarion Territory.

The failure of Cadwallader, Lord & Henne's well near the producer on the Normal School lot at Clarion, gives rise to recollections of the uncertainty of the sands on the old Clarion belt. Clarion county territory always was deceptive. And it always was irregular. Down on the old Foxburg hill good and poor wells were drilled side by side. At East Foxburg was a roaring gas well in the second sand with an 8 barrel production at best from the third, owned by Knowles & Panton, and all around it they had wells gasless in the second sand, but good for 25 to 75 barrels production in the third. On the Shoup farm, at Antwerp, M. E. Hess got a 200-barrel well and forty feet away Soult & Dower developed a 3-barrel pumper. Marcus Hulings' first well, on the Delo farm, when the sand was first cut, blew spray oil all over a 20-acre lease and acted as though it would never get done flowing. It made 50 barrels at best and was exhausted in three years. On the Texter farm, near Turkey Run, R. R. Armor got a well with a tight looking sand that only filled up about 100 feet, which he says was one of the best wells he ever owned. There is no telling about a Clarion well until it is drilled in, tubed and pumped a week, but they are not likely to disturb the trade with any great flood of oil.

Runs, Shipments and Stocks.

RUNS OR RECEIPTS.

PIPE LINE.	Dec. 1887.	Jan. 1888.
National Transit	919,953.65	803,536.82
Tidewater	116,986.79	96,658.54
Octave	2,529.73	1,931.32
Pittsburg	49,785.99	47,720.48
Southwest Penn'a	145,534.00	134,652.60
Western & Atlantic	47,545.29	36,948.40
Macksburg	17,079.08	16,257.33
Total	1,299,414.53	1,137,705.49
Daily average	41,916.59	36,700.18

In the above tables only oil received direct from the wells is taken into account.

DELIVERIES OR SHIPMENTS.

PIPE LINE.	Dec. 1887.	Jan. 1888.
National Transit	2,179,410.27	1,981,581.23
Tidewater	300,459.16	155,522.15
Octave	2,340.73	1,833.33
Pittsburg	50,622.81	47,879.40
Southwest Penn'a	16,843.60	35,559.11
Western & Atlantic	51,509.13	45,599.15
Macksburg	39,654.05	40,076.00
Total	2,640,839.75	2,308,050.37
Daily average	85,188.38	74,453.24

Daily average excess of shipments over runs:

January, 1888	37,753;05
December	43,271.79
November	43,863.54
October	21,078.16
September	10,502.53
August	8,973.79

NET STOCKS.

PIPE LINE.	Dec. 31. 1887.	Jan. 31. 1888.
National Transit	26,150,737.69	25,158,187,54
Tidewater	1,281,531.22	1,269,683.26
Octave	2,539.27	2,674.79
Pittsburg	130,159.36	130,338.84
Southwest Penn'a	346,543.67	253,897.54
Atlantic & Western	41,180.30	31,036.79
Macksburg	404,382.03	380,551.11
Total	28,357,073.54	27,226,369.87

Net stocks decreased:

January, 1888	1,130,703.67
December	1,300,415.55
November	1,249,321.18
October	482,993.39
September	293,299.48
August	284,874.16

	Runs.	Shipments.
Daily average, January	36,700.18	74,453.24
Daily average December	41,917.59	85,188.38
Daily average November	50,160.32	84,023 86
Daily average October	63,486.36	84,564.52

They Bid Thousands Easily.

The estate of the late Joseph R. Morse was sold recently at administrator's sale in the court house at Warren. The estate is oil property, situated near Kinzua Village, and is penetrated by 40 wells, with a production of 400 barrels. There were present at the sale among others: George V. Forman, of Olean; Mr. Williams, of the Union Oil Company; P. O. Heasley, of Eldred; Mike Finnigan and the administrator, C. P. Collins, of Eldred. Of the sale the Warren *Mirror* says:

Mr. James Cable stood on the stairs reading a description of a quantity of oil, gas and timber land lying in the vicinity of Billy Run and Kinzua and belonging to the estate of Joseph R. Morse, deceased. At the close of the reading, the lawyer stated that the court had authorized the sale of the property, for the purpose of settling the estate. He then asked for bids. A quiet looking man, leaning on the circular radiator bid one hundred and twenty thousand dollars. Then a large man with close-clipped, gray whiskers said one hundred and twenty-one thousand dollars, and a nice-dressed, young man, with a heavy black moustache, followed him with one hundred and twenty-two thousand dollars, and thus the bidding went on until $133,000 was reached, when Mr. Cable knocked down the property to the young man who gave the name of P. O. Heasley.

A Wyoming Oil Story.

Secretary Webster, of the Omaha Petroleum Company, was in Pittsburg recently, and while there went on record that the Standard Oil Trust was endeavoring to get control of the Wyoming oil fields. Mr. Webster says the development in that field is confined to three wells, which would produce 600 barrels a day of lubricating oil if they were not plugged. These are owned by the Omaha company, which is capitalized at $1,000,000. It is possible that, like the $10,000,000 National Oil Trust Company of St. Louis, it may have some treasury stock for sale at 25 cents a share. It is true, however, that the Standard has paid considerable attention to Wyoming with a view to purchase, and if it thought there was much oil there it would probably not hesitate to bid for the whole territory, including the political machine and Indian agencies.

Ohio Oil Operations.

The report of operations in the Ohio field for January is as follows:

WELLS COMPLETED.

Lima	5
North Baltimore	18
Findlay	2
Total	25
Completed in December	22
Increase	3

	Rigs.	Wells Drilling.	Total.
Lima	23	4	27
North Baltimore	21	17	38
Findlay	10	8	18
Total	54	29	83
For December	44	30	74
Difference	10	1	9

The Gas Driller's Find.

In boring for gas at Attica, Ind., at a depth of 570 feet a strong vein of water was struck, which contains, according to the State chemist's analysis, lithium, magnesia, and soda combined. This makes one more lithia spring in this country, the number of which can be counted on the fingers of one hand, for these springs are very rare. The greatest one of this description is at Saratoga, the analysis of which shows less than ½ grains of lithia to the quart, while the Attica spring has a fraction more than this. The force of this recently discovered spring is said to be wonderful, flowing 300 gallons per minute and carrying the water to a distance of 180 feet through a 5-inch tube.—*American Druggist.*

Stocks Abroad.

Reports of stocks in London and the seven principal Continental ports are summarized in the following statement:

Stocks Afloat and Ashore.	*Jan.* 21, 1888. *Barrels.*	*Dec.* 24, 1887. *Barrels.*
Seven Continental ports	634,536	684,713
London and English ports	198,946	296,386
Total stocks afloat and ashore	833,482	1,015,599
Decrease in stocks since December 24	182,117	

A detailed statistical table giving the stocks on hand, the stocks in vessels on the ocean, and the amount unloading from the vessels at the different ports is appended, which shows at a glance the condition of affairs abroad and the increase or decrease as compared with the corresponding period of 1886. The shipments represent the amount of oil going to the interior of Europe from the seaports:

STOCKS IN FOREIGN PORTS JANUARY 21, 1888.

Ports.	*Stocks January* 21.		*Stocks afloat January* 21.		*Loading January* 21.		*Grand total stocks afloat and loading.*		*Receipts from July* 1.		*Shipments from July* 1.	
	1887 *Barrels.*	1888 *Barrels.*	1887 *Barrels.*	1888 *Barrels.*	1887 *Barrels.*	1888 *Barrels.*	1887 *Barrels.*	1888 *Barrels.*	1886 *Barrels.*	1887 *Barrels.*	1886 *Barrels.*	1887 *Barrels.*
Bremen	104,683	27,118	99,080	91,716	48,500	14,500	252,263	133,334	370,737	446,382	477,430	569,650
Hamburg	22,165	28,695	69,022	125,244	41,500	49,000	132,687	202,939	582,336	673,801	715,036	761,187
Antwerp	58,309	13,000	45,418	105,837	56,100	19,500	159,827	138,337	531,236	489,501	633,628	581,183
Rotterdam	34,896	24,136	14,189	13,392	8,500	17,000	57,585	54,528	367,381	349,399	414,424	375,146
Amsterdam	28,043	12,559	16,456	48,538	7,000	.....	51,499	61,097	164,007	139,795	203,442	158,474
Stettin	25,972	29,489	.....	3,137	3,000	.....	28,972	32,626	280,135	268,853	269,956	275,975
Danzig	29,415	7,974	8,443	3,701	.....	.....	37,858	11,675	54,945	37,259	54,777	55,620
Total	303,483	142,971	252,608	391,565	164,600	100,000	720,691	634,536	2,350,777	2,409,990	2,768,693	2,777,235
London	78,712	46,625	45,950	90,521	86,300	27,200	205,962	164,346	346,086	457,483	455,249	512,883

	1885	1886	1887	1888
Total stocks Continental ports	802,800	379,621	303,483	142,971
Total afloat " "	182,447	231,266	252,608	391,565
Total loading	66,700	158,500	164,600	100,000
Total	1,051,947	769,387	720,691	634,536
Afloat and loading for direct Continental ports	.....	23,400	.....	.....
" " " Baltic Sea, exclusive Stettin and Danzig	4,000	8,000	12,500	.....
Total Afloat and loading for Continental ports	1,055,947	800,787	733,191	634,536
" " " " " London	130,903	217,407	205,962	164,346
" " " " " English harbors, exclusive London	80,000	21,300	99,000	34,600
Grand total	1,266,850	1,039,494	1,038,153	833,482

OFFICIAL STATEMENT—EXPORTS OF PETROLEUM, JANUARY, 1888.

BY WM. F. SWITZLER, CHIEF OF THE BUREAU OF STATISTICS, WASHINGTON, D. C., FEBRUARY 8, 1888.

Customs Districts.	*Mineral Crude.*		*Napthas.*		*Illuminating.*		*Lubricating and Parafine Oils.*		*Residuum.*		*Total.*	
	Gallons.	*Dollars.*	*Gallons.*	*Dollars.*	*Gallons.*	*Dollars.*	*Gallons.*	*Dollars.*	*Gallons.*	*Dollars.*	*Gallons.*	*Dollars.*
Boston & Charlestown, Mass.	.....	.....	250	63	286,943	25,404	8,373	1,792	.....	.....	295,566	27,259
New York, N. Y.	5,331,624	429,145	506,464	39,007	19,727,781	1,530,481	1,437,503	258,505	546	48	27,003,918	2,257,186
Philadelphia, Pa.	3,499,338	270,898	153,337	10,734	3,702,910	312,051	169,980	9,083	.....	.....	7,525,565	602,766
Baltimore, Md.	.....	.....	.....	.....	600,309	47,491	.....	.....	.....	.....	600,309	47,491
Total Jan., 1888.	8,830,962	700,043	660,051	49,804	24,317,943	1,915,427	1,615,856	269,380	546	48	35,425,358	2,934,702
Total Jan., 1887	8,097,185	519,757	975,730	88,932	37,057,349	2,925,615	1,284,621	219,333	120,666	5,600	47,535,551	3,759,237
Total 7 months ending Jan. 31, '88	57,545,267	3,799,098	8,128,819	674,487	270,440,307	20,424,644	12,738,831	2,132,413	606,396	29,217	349,459,620	27,059,859
Total 7 months ending Jan. 31, '87	52,226,920	3,338,066	11,742,474	1,030,032	282,909,875	21,994,765	8,777,820	1,663,019	986,278	49,998	356,643,367	28,075,880

CRUDE QUOTATIONS FOR JANUARY, 1888.

Day of Month and Week.	Bradford.				Oil City.				New York.				Pittsburg.			
	Opened.	*Highest.*	*Lowest.*	*Closed.*	*Opened.*	*Highest.*	*Lowest.*	*Closed.*	*Opened.*	*Highest.*	*Lowest.*	*Closed.*	*Opened.*	*Highest.*	*Lowest.*	*Closed.*
2—Monday	Holiday.															
3—Tuesday	90	95½	90	95½	90¼	96	90¼	95⅞	90⅛	95½	90⅛	95⅜	90	95¾	90	95¾
4—Wednesday	96½	98	92¾	92¾	96¼	97⅛	92¼	92¾	95⅝	97	92½	92¾	96¼	97½	91¾	92⅞
5—Thursday	92¾	94¾	92	94	92¾	94⅞	92¾	94	92½	94⅞	92½	94	92¾	94⅞	92⅝	94
6—Friday	94⅛	94¼	92⅞	93	93½	93¾	92⅜	92⅞	94	94¼	92¾	93	93	93⅞	92¾	93
7—Saturday	93⅛	94⅞	93⅛	94⅞	93⅞	95	93½	94⅞	93⅛	94¾	93⅛	94⅝	93⅝	95	93⅝	94⅞
9—Monday	95¾	96¾	94½	96¾	95¼	96⅞	94⅜	96¾	95	97⅛	94⅜	96¾	94¾	97	94¼	96¾
10—Tuesday	97½	97½	95½	95¾	97¼	97½	95⅜	95⅞	97¼	97⅜	95⅜	95⅞	97	97¾	95⅜	95¾
11—Wednesday	95¾	95⅞	95⅝	95⅜	95¾	95⅞	94½	95¼	95¾	96	94½	95¼	95¾	96	94½	95¼
12—Thursday	95⅝	96¼	94⅜	96¾	95½	96⅞	95½	96⅜	95½	97	95½	96¾	95½	96¾	95½	96¾
13—Friday	96¾	96⅞	93¼	94	96⅝	96¾	93¼	93½	96¾	96⅞	93¼	94	96⅞	96⅞	93	94
14—Saturday	93½	93½	89	92¼	93¾	93¼	88½	92¼	94	94	88⅞	91½	93¾	94	89	92¼
16—Monday	92⅛	93½	89⅛	89½	92¼	93¼	88⅞	89½	91¾	93⅜	89	89⅝	92½	93¼	89	89⅜
17—Tuesday	89⅞	90⅝	85	86⅞	90½	91	85⅜	86¾	90	90⅝	85¼	86⅞	90¼	90⅞	84¾	86⅞
18—Wednesday	87	88⅝	86⅜	88⅝	87¼	88¾	86⅜	88¾	87¼	88¾	86½	88⅝	87½	88⅝	86½	88⅝
19—Thursday	89	90⅛	88½	90	89½	90⅛	88⅝	89⅞	89⅛	90	88½	89⅞	89	90	88⅜	90
20—Friday	90	91¼	89½	91⅛	90¼	91⅛	89⅝	91	90¼	91¼	89½	91⅛	90	91¼	89½	91
21—Saturday	91¼	93¼	89⅛	90¼	91½	93⅜	88⅞	90¼	91¼	93¼	91¼	92⅛	91⅜	93⅜	89	90⅛
23—Monday	90⅞	90⅞	88½	89	91	91¼	88⅝	89	90½	90⅞	88⅜	89	91	91	88⅛	88⅞
24—Tuesday	89	89⅞	86½	86⅞	89¼	89⅞	87	87⅛	89	89⅞	86⅞	87	88¾	90	86¾	87
25—Wednesday	87⅛	88⅜	85½	88¼	87⅛	88½	85¼	88⅜	87	88⅜	85⅜	88⅜	86⅞	88½	85¼	88¼
26—Thursday	88⅞	89	87⅝	88½	89	89	87⅝	88⅝	88¾	89	87⅝	88⅝	88½	89	87⅝	88½
27—Friday	88	88⅝	86¼	88⅛	88¾	88¾	86¼	88⅜	88⅛	88¾	86¼	88¼	88⅛	88¾	86⅛	88¼
28—Saturday	88⅜	89⅜	87⅛	89	88¼	89⅜	87¼	89	88¼	88⅝	87⅛	88½	88½	89⅜	87⅛	89
30—Monday	89⅜	90⅝	89¼	90⅛	89½	90¾	89⅛	90⅛	89¼	90¾	89⅛	89¾	89⅛	90⅝	89⅛	90⅛
31—Tuesday	90⅛	90¾	89¼	90½	90⅛	90¾	89¼	90⅝	89⅞	90¾	89¼	90⅝	90¼	90⅝	89¼	90½

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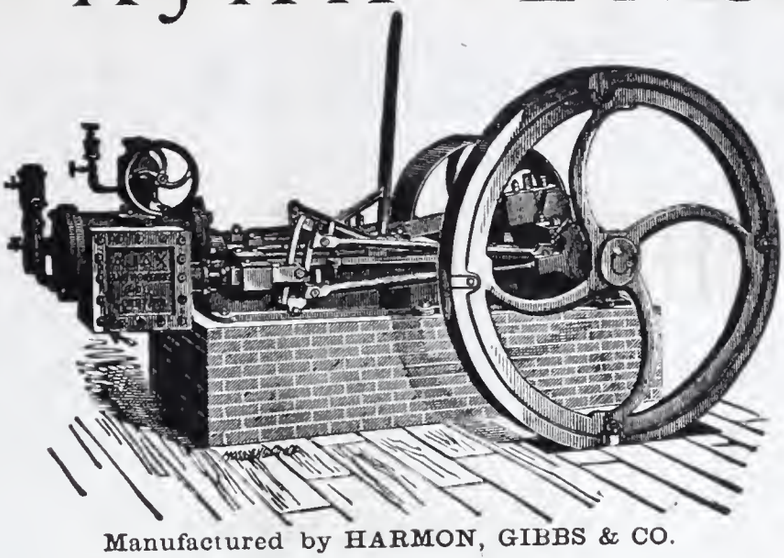

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THE DAILY OIL NEWS,

St. James Place, Bradford, Pa.

W. & W. R. R. Time Table.

NORTHW'D. 3	NORTHW'D. 1	STATIONS.	SOUTHW'D. 2	SOUTHW'D. 4
2 00	6 00	Lv.. Waynesburg ..Ar	10 35	6 25
2 15	6 15	..... Sycamore.....	10 17	6 07
2 23	6 23	.....Swart.... ...	10 09	5 59
2 30	6 30	.....Deer Lick.... ..	10 02	5 52
2 38	6 38	.....West Union.....	9 53	5 43
2 47	6 47	....Dunn.....	9 43	5 33
2 50	6 50	....Lindley's Mills....	9 40	5 30
3 01	7 02	.....West Amity	9 28	5 18
3 06	7 08	.....Luellen....	9 22	5 12
3 11	7 13	... .Baker.....	9 17	5 07
3 14	7 20	.....McCracken.....	9 13	5 00
3 27	7 35	.....Vankirk.....	9 00	4 47
3 40	7 50	.....Braddock.....	8 48	4 33
3 55	8 05	Ar ..Washington ..Lv	8 35	4 20
6 36	9 55	Ar.... Pittsburg....Lv	6 10	1 55
		P. C. & St. L. R. R.		

Time given above is Central Standard, which is 40 minutes slower than Pittsburg or local time, or one hour slower tban Eastern time.

The Company reserve the right to vary from this schedule as circumstances may require. All trains daily except Sunday.

C. E. BOWER, Superintendent.

Buffalo, Rochester & Pittsburg Railway.

The new short line between Buffalo, Rochester, Pittsburg, Cincinnati, Chicago, St. Louis, Kansas City, San Francisco and all points North, South, East and West.

For tickets, time tables and full information call on D. Lundergan, agent B., R. & P. depot ticket office. or at Main street ticket office in Riddell House block, Bradford.

Time table in effect Sept. 11, 1887.

Eastward. Westward.

12 Buff Mail	10 Buff Ex.	STATIONS Buffalo Division.	9 Br'd Ex.	11 Br'd Mail
p m	a m		a m	p m
3 30	7 45	Lv..... Bradford .....Ar	11 15	8 05
3 33	7 48	..... Kendall.....	11 12	8 02
3 41	7 56	.....Limestone..... ..	11 04	7 54
3 53	8 08	.....Carrollton.....	10 52	7 42
4 31	8 46	.....Ellicottville.....	10 14	7 04
4 40	8 55	..... Ashford.....	10 05	6 55
5 15	9 30	... . Springville.....	9 30	6 20
6 35	10 50	Ar..... Buffalo Lv	8 10	5 00
p m	a m		a m	p m
		Rochester Division.		
*2 Acm	4 Rch Ex.	STATIONS.	1 Mail	3† Br'd Ex.
a m	p m		p m	p m
4 55	2 30	Lv..... Bradford .....Ar	12 30	10 25
5 05	2 42	....Limestone.....	12 18	10 14
5 18	2 54	.....Carrollton..	12 07	10 02
5 26	3 09	..... Salamanca	11 51	9 41
5 56	3 40	..... Ellicottville.	11 20	9 23
7 22	5 11	..... Gainesville	9 51	8 00
7 44	5 34	..... Warsaw	9 27	7 35
8 25	6 23	.... LeRoy	8 43	6 40
9 25	7 15	Ar. ....Rochester. Lv	7 50	5 40
a m	p m		a m	p m
		Pittsburg Division.		
1 Mail		STATIONS.		4 Mail
p m				p m
12 55		Lv ..... Bradford.....Ar		2 15
3 26		..... Ridgeway.....		11 38
4 51		.....Falls Creek.....		10 14
4 58		.....Du Bois.....		10 08
5 59		Ar.....Punxsutawney.....Lv		9 00
p m				a m

*Leave Perry 7:00 a. m.

†Runs to Silver Lake and Perry without change.

Connections for East and West are made at Rochester with New York Central & Hudson River R. R., and at Salamanca with the N. Y., P. & O. R. R. for Jamestown, Mansfield, Cincinnati, Chicago and the West, at Ridgway with the Philadelphia & Erie R. R. for Emporium, Williamsport, Philadelphia and Baltimore, at Falls Creek with the Allegheny Valley Railroad for Pittsburg, Wheeling, Cincinnati, St. Louis and the West and South.

Thousand-mile tickets sold at two cents per mile.

J. P. THOMPSON, Gen. Pass., Agt., Rochester.

G. W. BARTLETT, Gen. Supt., Buffalo, N. Y.

PITTSBURG & WESTERN RAILROAD.

In effect Oct. 24, 1887. Central time. One hour slower than Eastern time.

NORTHERN DIVISION.

SOUTHBOUND TRAINS.

STATIONS.	No. 7.	No. 23.	No. 25.	No. 17.	No. 19.
	A M	A M	A M	A M	P M
Bradford Lv	.....	.....	.....	7 30	...
Mt. Jewett.....	.....	.....	.....	9 15	
Kane....	.....	.....	.....	10 10	..
Sheffield Junc...	.....	.....	.....	11 04	....
				P M	
Marienville	.....	.....	.....	12 12	
Tylersburg	.....	.....	.....	12 55	
Clarion Junction	.....	.....	6 20	1 45	4 00
Clarion	.....	.....	5 50	12 35	3 30
Shippenville	.....	.....	6 30	1 58	4 14
Knox....	.....	.....	6 45	2 14	4 33
St. Petersburg..	.....	.....	7 24	3 04	5 20
Foxburg.....	.....	5 40	7 38	3 25	5 40
Parker.....	.....	5 50	7 48	3 36	....
Bruin.....	.....	6 08	8 06	3 59	...
Petrolia	.....	6 18	8 17	4 10	—
Karns....	.....	6 22	8 22	4 17	9
Millerstown.....	.....	6 36	8 36	4 32	
St. Joe.....	.....	6 50	8 50	4 45	P M
Butler.....	5 15	7 18	9 30	5 20	1 50
Renfrew....	5 28	7 39	9 46	5 38	2 13
Callery Junction	5 50	8 05	10 10	6 00	2 35
Allegheny.... Ar	7 10	9 33	11 25	7 23	4 00

NORTHBOUND TRAINS.

STATIONS.	No. 34.	No. 8.	No. 18.	No. 24	No. 26
	P M	A M	A M	P M	P M
Allegheny ... Lv	5 40	9 20	7 20	1 40	4 40
Callery Junction	7 30	10 50	8 40	3 00	6 10
Renfrew.....	8 02	11 12	9 00	3 21	6 33
Butler	8 30	11 30	9 21	3 50	7 05
St. Joe..	.....	.....	9 50	4 15	7 38
Millerstown.....	.....	.....	10 06	4 32	7 53
Karns....	.....	—	10 20	4 45	8 06
Petrolia....	.....	20	10 24	4 50	8 10
Bruin....	.....	.....	10 35	5 00	8 22
Parker	.....	A M	10 52	5 18	8 39
Foxburg.....	.....	6 27	11 25	5 45	8 50
St, Petersburg ..	.....	6 44	11 41	6 00	.....
			P M		
Knox....	.....	7 49	12 32	6 45	.....
Shippenville	.....	8 11	12 53	7 02	.....
Clarion Junction	.....	8 30	1 14	7 15	.....
Clarion	.....	9 00	2 15	7 45	.....
Tylersburg....	.....	.....	1 48	.....	.....
Marienville.... .	.....	.....	2 26	.....	.....
Sheffield Junc...	.....	.....	3 06	.....	.....
Kane.... .....Ar	.....	.....	3 58	.....	.....
Mt. Jewett.....	.....	.....	4 40	.....	.....
Bradford..... ..	.....	.....	6 35	.....	.....

No. 4 leaves Allegheny at 6 a m; Callery Junction, 7:30; Renfrew, 7:15; arrives at Butler 8:10 a m.

No. 29 leaves Butler 11:45 a m; Renfrew, 12:06; arrives at Callery Junction 12:25; Allegany, 1:55 p m.

Westbound train leaves Callery Junction as follows:

Cleveland and Toledo express 8:35 a m; New Castle accommodation 3:05 p m; Chicago express, with through sleeping car, 1:44 p m; Zelienople accommodation 6:10 p m.

Sunday trains, Nos 23, 26 and 29, run daily. On Sundays No. 24 will run 25 minutes late and connect at Callery Junction for New Castle. No. 29 one hour late and connect at Callery Junction with Chicago express.

Nos. 7 and 17 will run daily between Butler and Allegheny.

No. 50, Sundays only. Leaves Allegheny at 12:40 p m; Callery Junction, 1;50 p m; arrives at Renfrew 2:14;. Butler, 2:35.

C. W. BASSETT,
General Passenger Agent.

Dunkirk, Allegheny Valley & Pittsburg.

Going North.	No. 2.	No. 4.	No. 6.
	A M	P M	A M
Titusville Lv	7 35	3 20	7 35
Grand Valley..... "	8 03	3 48	8 01
Irvineton ..... "	8 45	4 36	8 44
Warren..... "	8 58	4 53	8 56
Junction..... "	9 55	5 45	9 48
Lilly Dale.... "	10 50	6 36	10 37
Dunkirk..... Ar.	11 25	7 10	11 12

Going South.	No. 1.	No. 3.	No. 5.
	A M	P M	P M
Dunkirk. Lv	9 25	4 00	2 40
Lilly Dale..... "	10 03	4 38	3 14
Junction..... "	11 02	5 45	4 08
Warren..... "	11 55	6 44	5 06
	P M		
Irvineton..... "	12 10	7 00	5 22
Grand Valley..... "	12 58	7 49	6 12
Titusville..... Ar	1 20	8 15	6 40

Bradford, Bordell & Kinzua R. R

AND

Bradford, Eldred & Cuba R. R.

In effect Jan. 30, 1888.

Westward.					Eastward.		
	p m	a m	Ar	Lv	a m	p m	
	5 15	11 50	... Bradford...		7 25	2 25	....
	4 40	11 15	Kinzua Junct'n		8 05	3 05	....
	4 33	11 08	..Rew City. .		8 13	3 12	.....
	4 13	10 48	.Rixford . .		8 31	3 28	....
a m	4 08	10 43	.Duke Centre		8 36	3 33	a m
10 10	3 50	10 25	. Eldred.. .		8 55	3 50	1 25
9 45	3 32	10 10	. Bullis Mills		9 10	4 05	1 45
9 26	3 17	9 54	. . .Ceres . .		9 26	4 21	2 10
8 55	3 04	9 40	.Little Genesee.		9 40	4 35	2 35
8 40	2 55	9 30	. . Bolivar.. .		9 50	4 45	2 55
7 50	2 28	9 03	. Allentown..		10 15	5 12	3 35
7 00	1 55	8 30	lv Wellsville ar		10 50	5 45	4 15
a m	p m	a m			a m	p m	p m
	29	3	N.Y. L. E. & W.		8	22	
	10 45	2 37	..Hornellsville.		12 12	8 35	....
	8 48	11 58	. Elmira.. .		1 50	10 10	....
	6 55	11 28	. Binghamton		3 33	12 44	....
			Lv	Ar			
	11 30	5 00	. .New York		10 37	7 57	....
	p m	p m			p m	a m	
p m	p m	a m			a m		p m
7 40	....	10 35	ar..Bradford. lv		8 20	....	5 25
7 05	...	10 00	Kinzua Junct'n		9 00	....	6 05
6 59	10 02	9 54	. . .Aiken		9 06	....	6 11
6 53	....	9 48	.....Davis.. . .		9 12	9 23	6 17
6 47	9 50	9 42	....Simpson ...		9 18	....	6 23
6 35	....	9 30	. . .Ormsby		9 30	...	6 35
6 00	9 05	8 55	. .Smethport ...		10 05	10 15	7 10
6 00	....	8 55	...Mt. Jewett . .		10 05	.....	7 10
5 15	....	8 10	. . .Kane . . .	ar	10 50	....	7 55
p m	a m	a m			a m		

PITTSBURG & WESTERN.

1 04	....	.....	....Clarion.....		1 40	....	.....
12 32	....	.....	....Foxburg		3 25	....	.....
10 50	....	.....	. . .Parker.. . .		3 36	....	.....
....	....	.....	.....Petrolia		3 45	....	.....
9 21	....	.....	. . .Butler.....		5 20	....	.....
			Lv	Ar			
7 20	a m	....	. . Allegheny.		7 20	p m	....

No Sunday Trains.

JNO. C. McKENNA,
Supt. and Gen. Pass. Agt.

PHILADELPHIA & ERIE RAILROAD.

Time table in effect Nov. 15, 1886. Eastern standard time.

Eastward.	No. 18.	No. 8.	No. 4.	No. 12.
	A M	A M	P M	P M
Erie..... Lv	7 35	.....	2 45	5 25
Corry ...."	9 00	.....	4 13	6 55
Irvineton..... ....."	9 50	.....	5 00	7 50
Warren.. .....,"	10 05	.....	5 15	8 05
Kane.... .....Ar	11 25	.....	6 30	9 15
Kane..... Lv	.....	6 25	6 55	.....
Johnsonburg ....."	.....	6 58	7 30	.....
Emporium Junction.."	.....	8 30	9 15	.....
Lock Haven ... ."	.....	11 15	11 58	.....
		P M	A M	
Williamsport..... ..."	.....	12 20	1 25	....
Harrisburg.....Ar	.....	3 13	4 30	.....
Philadelphia....."	.....	6 50	8 25	.....

Westward.	No. 11.	No. 3.	No. 11.	No. 17.
	A M	P M	A M	P M
Philadelphia. Lv	.....	11 25	7 40	.....
		A M		
Harrisburg .. . ."	....	3 30	11 25	.....
			P M	
Williamsport..... ..."	.....	7 10	2 25	.....
Lock Haven ....."	.....	7 58	3 15	.....
Emporium Junction.."	.....	10 30	6 25	.....
Johnsonburg....."	.....	12 00	8 02	.....
		P M		
Kane.... .....Ar	.....	12 40	8 35	.....
Kane Lv	6 35	1 00	.....	4 10
Warren..... ....."	7 45	1 58	.....	5 25
Irvineton..... ....."	7 58	2 09	.....	5 46
Corry..... ....."	8 55	2 56	.....	6 45
Erie .. ..Ar	10 10	4 00	....	8 05

Trains daily except Sunday.

Through-car arrangement westward—Erie mail—Pullman palace sleeping cars Philadelphia to Erie, and Philadelphia to Williamsport (cars open to receive passengers at Philadelphia at 10 p m), and Washington to Williamsport. Passenger coaches from Philadelphia to Erie, and Baltimore to Williamsport.

Niagara express—Pullman parlor car Philadelphia to Williamsport.

Through-car arrangement eastward—day express—Pullman parlor car Williamsport to Philadelphia. Passenger coaches Kane to Philadelphia, and from Williamsport to Baltimore.

Erie mail—Pullman sleeper Erie to Philadelphia, and Williamsport to Philadelphia (car open to receive passengers at Williamsport at 9 p m). Passenger coaches Erie to Philadelphia, and Williamsport to Baltimore. Sleeping car Williamsport to Washington.

WHEELING & LAKE ERIE RAILROAD.

Time table in effect Jan. 8, 1888. Central standard time.

Eastward.	No. 5.	No. 7.	No. 9.*	No. 1.*
	A M	P M	P M	A M
Toledo.....Lv	7 45	1 10	4 50	.....
Oak Harbor..... Ar	8 41	2 05	5 45	.....
Fremont	9 06	2 30	6 10	.....
Clyde	9 22	2 47	6 25	.....
Bellevue.....	9 37	3 03	6 40	.....
Monroeville.....Lv	9 55	3 20	6 58	3 10
Norwalk....	10 10	3 38	7 15	3 22
Wellington	11 00	4 32	8 08	4 00
Creston	11 53	5 20	9 05	4 47
	P M			
Orrville.... ....Ar	12 20	5 48	9 40	*5 15
			A M	
Orrville.....Lv	12 40	5 53	7 05	7 05
Massillon ..... } Ar	1 20	6 35	7 52	7 52
Massillon ..... } Lv	1 20	6 35	7 52	7 52
Navarre.....	1 35	6 50	8 10	8 10
Valley Junction....Lv	2 15	7 40	8 55	8 55
New Cumberland....	2 28	7 53	9 10	9 10
Sherrodsville.....	2 40	8 05	9 25	9 25
Leeesville.....	2 48	8 13	9 40	9 40
Bowerston.....Ar	2 55	8 20	9 50	9 50
Canal Dover.....	2 57	6 05	.....	.....
		A M	....	.....
New Comerstown.....	3 38	6 45	.....	.....
Cambridge.....	4 38	7 45	.....	.....
Macksburg.....	6 09	9 15	....	.....
Marietta... ..... Ar	7 25	10 25	.....	.....

Westward.	No. 5.	No. 8.	No. 4	No. 2.
	A M	P M	A M	
Marrietta Lv	6 00	12 10	.....	.....
Macksburg.....	7 15	1 24	.....	.....
Cambridge.....	8 57	3 00	.....	.....
New Comerstown	10 00	4 00	.....	.....
Canal Dover.....	10 42	4 40	....	.....
Bowerston.....	11 25	3 45	5 55	.....
Leesville	11 32	3 55	6 02	.....
Sherrodsville	11 40	4 10	6 10	.....
New Cumberland	11 52	4 25	6 22	.....
	P M			
Valley Junction.....	12 20	5 02	6 45	.....
Navarre.....	12 50	5 35	7 35	.....
Massillon.....	1 05	5 50	8 00	.....
Orrville..... } Ar	1 40	6 25	8 55	.....
Orrville..... } Lv	1 45	*6 35	9 13	.....
Creston....	2 18	7 02	9 42	.....
Wellington.....	3 05	7 43	10 33	A M
Norwalk.....	3 55	8 25	11 25	7 25
Monroeville.....	4 07	8 35	11 37	7 35
Bellevue.....	4 23	9 15	11 55	7 51
			P M	
Clyde	4 39	9 29	12 10	8 06
Fremont.....	4 55	9 45	12 28	8 23
Oak Harbor	5 20	.....	12 53	8 45
Toledo.... .....Ar	6 20	*10 45	1 50	9 40

HURON DIVISION.

Northward.	No. 25.	No. 27.		
	A M	P M		
Monroeville.....Lv	.....	.....	.....	.....
Norwalk.... ..... } Ar	.....	.....	.....	.....
Norwalk.... ..... } Lv	7 00	3 55	.....	.....
Milan..... .....Ar	7 25	4 20	.....	.....
Friese Landing	7 37	4 32	.....	.....
Huron	7 55	4 50	.....	.....

Southward.	No. 26.	No. 28.		
	A M	P M		
Huron Lv	9 10	5 30	.....	.....
Friese Landing.....	9 25	5 45	.....	.....
Milan....	9 45	6 03	.....	.....
Norwalk.... ..... } Ar	10 20	6 30	..	.....
Norwalk.... ..... } Lv	.....	.....	.....	.....
Monroeville.....Ar	.....	.....	.....	.....

*Daily.

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Olean express	7:15 a. m.
Buffalo mail	2:15 p. m.
Olean express	4:15 p. m.
Sunday train	9:15 a. m.

FOR DALLAS, RIXFORD AND ELDRED.

Eldred express	8:30 a. m.
Eldred accommodation	1:40 p m.
Eldred express	5:15 p. m.

Train leaving Bradford at 5:15 p.m. for Eldred makes direct connections for Williamsport, Harrisburg, Philadelphia and points East.

"Bradford Short Line"

FOR SONG BIRD, MARSHBURG, KINZUA, OIL CITY AND PITTSBURG.

Kinzua accommodation	6:30 a. m.
Pittsburg express	9:15 a. m.
Oil City express	4:20 p. m.

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J. A. FELLOWS, Gen'l Pass. and Ticket Agent, 84 Exchange street, Buffalo, N. Y.

Shenango & Alleggheny R. R.

Trains are run by Standard Central Time (90th Meridian.)

NORTHW'D. 6 P. M.	NORTHW'D. 2 A. M.	STATIONS.	SOUTHW'D. 1 A. M.	SOUTHW'D. 5 P. M.
8 05	10 40	Ar....Greenville...Dp	6 07	3 20
7 55	10 30	.....Shenango.....	6 17	3 33
7 41	10 17	.....Kremis.....	6 29	3 44
7 31	10 08	.....Fredonia.....	6 37	3 52
7 24	10 02	.....Coolspring.....	6 42	3 56
7 23	10 01	.....Kerby Siding....	6 43	3 57
7 12	9 50	.....Mercer.....	6 57	4 08
7 02	9 40	.....Pardoe.....	7 07	4 17
6 57	9 36	.....Filer.....	7 11	4 22
6 49	9 29	.....Grove City.....	7 19	4 28
6 46	9 26	.....Reed.....	7 20	4 30
6 35	9 16	.....Harrisville.....	7 33	4 41
6 30	9 12	.....Wick.....	7 37	4 45
6 25	9 07	.....Branchton.....	7 42	4 50
6 22	9 05	..Coaltown Junction..	7 44	4 52
6 19	9 03	.....Keisters.....	7 47	4 55
6 11	8 56	.....Hallston.....	7 56	5 02
6 02	8 46	.....Euclid.....	8 07	5 11
5 53	8 37	.....Jamisonville....	8 17	5 19
5 45	8 30	.....Oneida.....	8 30	5 25
5 35	8 20	..P. &. W. Junction..	8 40	5 35
5 25	8 15	Dp.....Butler.....Ar	8 43	5 37
		Pittsburg & Western.		
3 30	6 00	.....Allegheny.....	10 30	7 35
P. M.	A. M.		A. M.	P. M.

HILLIARD BRANCH.

10 A. M.	12 A. M.	STATIONS.	9 A. M.	11 P. M.
12 00	7 30	Ar...Branchton....Dp	9 10	6 30
11 50	7 20	.....Bovaird.....	9 20	6 35
11 30	6 56	.....Annandale.....	9 40	7 00
11 20	6 48	.....Roy.....	9 50	7 10
11 00	6 40	Dp....Hilliard.....Ar	10 00	7 20

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THE PETROLEUM AGE,

Bradford, Pa.

THE PETROLEUM AGE.

Vol. VII. BRADFORD, PA., MARCH, 1888. No. 2.

"Si" Hughes. J. C. Tenant. Joe P. Cappeau. Owen Evans. "Jule" Rathburn. Dan Herring. J. C. M'Mullen. John B. Drake.

A GROUP OF FAMOUS OIL SCOUTS.

FAMOUS OIL SCOUTS.

THE MEN WHO WATCH THE "MYSTERIES" IN THE PENNSYLVANIA OIL FIELDS.

[*From the Buffalo Sunday Express.*]

IN a country so fiercely energetic and pushing as the United States, where the highest tension is constantly maintained in commercial affairs, it seems unnecessary to refer to the energy displayed in the development of any particular industry. But even in this land of progress there are varying degrees, and nowhere is there more impetuous forging ahead than in the oil-producing regions. There is a vividness about oil country life that once experienced is never forgotten. Beginning at nothing twenty-nine years ago, the petroleum industry has reached an important standing in the commercial world, the exported products alone being valued at $45,000,000 to $50,000,000 annually. The element of uncertainty attending the production of crude oil has led to the creation of a bold and daring speculative spirit in those engaged in the business, and the keenest competition imaginable. This combination of conditions gave rise to the occupation of "oil scouting," and in this vocation was the ceaseless energy, sharp competition, nervous haste, acute perception, and bold, daring execution of the whole industry typified.

The development of the Cherry Grove region of great flowing wells, many of which were "mysteries" in 1882, called the business into full development. "Scouting" was not unknown up to that time, though prior to that year the newspapers of that region were largely depended upon for information of new developments. There were, perhaps, four or five scouts besides the field reporters. when Grace & Dimick boarded up the derrick at their wildcat well in the heart of a hemlock forest, about nine miles southwest from Clarendon. This well soon became famous as the "646 mystery," being located on the lot of that number. The scouts who were in the field were soon on the ground watching the well. But the derrick was carefully closed up to conceal anything that might take place therein, the tanks were snugly housed and the doors kept locked, and the better to keep the secret of the well seven guards, armed with shot-guns, were stationed along the boundaries of the lease with instructions to allow no one to pass. This state of affairs was maintained for over two months.

In spite of all of these precautions, "Si" Hughes, the young man that sits at the extreme left of the group in the picture [see page 22], the pioneer of the scouting business, having watched developments through tht Bradford field, obtained full knowledge of all that was done at the well. Before the tanks were put up or the guards placed he was on the ground. Day and night he was there. He was ordered off the premises and obediently moved away, but just as often reappeared, unmoved by the threats of the guards to fill him with buck-shot if he did not stay away. For hours he sat in that hemlock forest, with the thermometer at zero, with a powerful field glass focussed on the well, observing every movement. Under the friendly cover of the darkness of night he crept up to the derrick and about the tank houses, timing the flows, getting specimens of sand and gleaning other information. The story has been published widely that he hid himself for over forty-eight hours under the derrick floor, where the mud and water from the sand pump was poured over him and frozen on him, but Mr. Hughes repudiates the idea that he would conceal himself in such a place, not because of the discomfort and hardship, but for the reason that he could neither see or hear anything of much value in that position.

Acting on Mr. Hughes' information, the Anchor Oil company secured much valuable land about the "mystery," which netted it over $500,000. When the well was finally opened and the great public learned what Hughes' had found out weeks before, that it was a thousand barrel well, the crude certificate market declined rapidly to the great profit of persons who had sold short on Hughes' information. Then the great rush to the field began, and leading speculators in all exchanges found it necessary to have scouts in the field, and large producers also saw the advantage of having quick and reliable advices. The business of "scouting" at once became a feature of the field. The shrewdest, most careful, reliable and practical men in the region were selected. Those who had had training as field reporters were in lively demand for their knowledge, and the rest were bright, intelligent men from other lines of business that had made them familiar with the various phases of the oil busines.

Among the field reporters who entered the new business at this time was Justus C. McMullen, late publisher of THE PETROLEUM AGE, and one of the editors and publishers of the Bradford *Daily Oil News*, whose recent death is still a poignant sorrow to his friends. In the picture he sits in front to the extreme right. He had already made an enviable reputation as an accurate, reliable statistician and field man when he became one of the "scouts." His conscientious accuracy was frequently noted during the time he lived in the shadows of the towering hemlocks of Cherry Grove, on Cooper Hill and at Balltown. When others telegraphed rumors and guesses, he staid up all night secretly to run the gauge pole in mystery tanks. When no important well was drilled in, his tireless energy was expended in mapping important locations, compiling statistics and getting geological records. He was not always first in the mad rush to the telegraph office, for he never telegraphed anything until he knew it to be right.

The last field work he did illustrated the integrity that actuated him. A week before his death he started out to collect the data for the monthly report of operations. There were conflicting reports regarding the Pittsburg Manufacturers' Gas company's well at Canonsburg, and to settle all doubts Mr. McMullen went to the well to get a gauge. He was sick then. Other fieldmen went out from Pittsburg with him. When they reached the well, they were told it had just made a flow and would probably not make another until the afternoon. They were told what the well was doing. This was good "hearsay" evidence, and as the thermometer stood several degrees below zero, the other fieldmen went away satisfied with it. Not so with "Mac." There had been false reports about the well and he must know the truth. For more than six hours he waited there, chilled to the very marrow, until the well flowed again and he had gauged the flow. Then he went back to Pittsburg, sick. But he did not give up. He must complete his oil report, and he did, though the pain he suffered was terrible. The data he brought home with him, and dictated to his loving wife from his deathbed, was as accurate and reliable as any every gathered.

During the palmy days of scouting, when every important well was made a mystery, there were many exciting adventures encountered by the scouts in their midnight work. Guards were sometimes lonely in the still watches of the night and amused themselves by firing their rifles, muskets or revolvers in a promiscuous manner, not calculated to encourage scouts prowling in the vicinity. J. C. Tenant, "the king of the scouts," one of the best of the trusty field men, known to the fraternity as "Jim," made a narrow escape from one of these random shots while watching the famous "Shannon mystery" on Cooper Hill in September, 1882. One night when he was stealing softly away from the tank house in search of his rubber coat, which he had left on a mossy log outside the "dead line," a bullet from a guard's rifle cut the knee of his pantaloons so close to the knee cap that he felt it passing. With his usual courage he kept on his way and stayed on the lease until morning. One of Mr. Tenant's exploits was getting up at midnight in Garfield, riding down the Balltown hill, fording the Tionesta through three feet of water, galloping five miles through virgin forest to a "mystery" owned by Capt. Peter Grace and others, and with the assistance of a fellow scout, drilled the well through the sand before morning.

This was an intensely dark night, the way was rough and dangerous for a horse to travel, but the scouts, who "slept with one eye open," learning that Tenant and another were going out at that unholy hour were soon out of bed, dressed, in the saddle and following. The well had been shut down for two weeks or more, just on top of the oil sand. Tenant and his companion soon had a roaring fire under the boiler, and when they had steam enough the tools were run down. "Jim" was an expert driller, having served nine years at the temper screw, and shortly after daylight he knew that that well was dry. The tools were drawn from the hole and placed as they had been before the drilling. The sand taken out was carefully collected and poured back in the hole, the fire under the boiler put out and a start made back to Garfield, when the scouts who had followed rode up, much to Tenant's surprise. Grace heard reports that his well was drilled in and dry. He hastened to the locality. There were some evidences that work had been done with the tools, and so he had the hole measured. The sand having been poured back in the hole, the line did not go down much farther than it had before, and the conclusion was reached that the sand had not been drilled into. But when the drillers were finally sent to bring in the well, they found very easy drilling and knew the truth at once. Mr. Tenant sits at the left hand side of the group, in front, reclining in the attitude in which the writer has seen him a hundred times when lounging at the foot of a stalwart hemlock watching a mystery well.

Many were the wild rides to a telegraph office nine or ten miles distant, each scout anxious to file the first message. Oftentimes the owners of the wells were of the cavalcade, urging their horses with whip and spur, but there is no case on record when owners were not beaten by some of the hard-riding fieldmen. The

best of horses were in demand, and the time made was, in some instances, remarkable, considering that the roads were of the roughest. Occasionally a horse, going at a mad gallop, would stumble over the rocks in its path and fall, throwing its rider over its head, but accidents were few. Mr. B. S. Tupper, the only one of the old time scouts who is constantly in the field yet, was thrown in this way on the road from Cooper Hill to Sheffield in the spring of 1883, and had his leg broken. He declined assistance from those coming after him, but refused to be moved out of the road to let them pass until they had taken his messages to deliver at the telegraph office. After filing the messages they returned at once and carried him tenderly to the town.

The following story of scout life is not true to character and incident, but on the whole is an excellent picture of the methods employed, both by the owners of the "mystery wells," anxious to keep their secret, and of the scouts, anxious to obtain it:

It was when a warm June sun was melting away the last dregs of ice that remained in the heaviest shadows of the deep hemlock forests adjacent to the upper waters of the Allegheny River, that some enterprising and reckless speculators located a test well to drill for oil in the very heart of one of the aforementioned forests. From the start the venture was intended to be a mystery to such other enterprising speculators as might have an interest in knowing its result. The tall derrick was perched on the summit of a high hill, and when drilling was begun the creak of the heavy walking beam, the discordant note of the pulley at the crown of the derrick, the shrill hissing of steam escaping from the boiler and the clang of the tool-dresser's heavy forge hammer served to frighten away from the spot all the wild things that had before peopled it, leaving the four workmen there alone. After the novelty of the first few days had passed it became terribly lonely for those men. Then it was the wish came to them that some of the wild things that had scurried away when they came would come back and give voice to their savage growls and cries to break the monotony.

The occasional advent of one of the owners, or a wagoner bringing provisions or other supplies, was an event hailed with joy. On such occasions the rude shanty, which served as kitchen, parlor and sleeping apartment for the men, took on its holiday attire. The visitor was invited to sit at the festal board, and was plied equally with the best the store could furnish of eatables and drinkables, and questions concerning the events of the great world beyond.

But at last an eventful day came. The oil rock was penetrated more than a third of a mile below the surface, and a puff of gas came up from the mysterious depths. The tools were quickly drawn up from the hole, the fire under the boiler quenched, and the contractor set out on a pilgrimage to the nearest telegraph office ten miles distant. The news was flashed over the wires to the owners late that night, and before evening the next day they were gathered with the workmen in the shanty at the well, top-booted, spurred and travel-stained. All night busy preparations went forward. The derrick was closely boarded up, the tanks housed over, and every precaution taken to prevent any chance-comers from seeing anything likely to aid them in making an estimate. Two of the men were released from further duty and dispatched to the nearest town to employ ten men to stand guard about the well and prevent intrusion. All this having been attended to, the tools were run down and a few strokes given. A rush of oil and gas came up the long rock-bound tube, broke in spray against the derrick roof, and subsided. The tools were hastily drawn up again, and they were followed by another flow of oil and gas stronger than the first, and which did not cease as the other had. Three long pine plugs were fitted to the hole and pounded down with the two tons' weight of tools, but a steady stream of petroleum still came forth. Old coats, old hats, coal ashes, and rubbish of every description were forced down to gag the tell-tale mouth: but all these efforts proved unavailing, the stream was turned through the long iron lead-pipes to the tanks, the pipes being muffled so as to prevent the flow making any more noise than possible, and then the great mystery was before the petroleum trade.

While these busy scenes were enacting at the well, others were not idle. The bold speculators were missed from their accustomed haunts, and telegraphic whispers went far and wide that something was brewing in the wilderness that might create a great commotion in the petroleum regions and in speculative circles elsewhere. Field scouts sent hasty messages to their principals in the Oil Exchanges, vaulted into the saddle and were on the trail. At the little town they learned that the owners of the mystery had gone out the day before; that two of the workmen had come in from there, hired ten guards and sent them out, and then boarded a home-bound train. The meaning of this was too evident, as the men would not have gone home unless the well was down to the oil sand.

Over the rough roads clattered the hoofs, up hill and down hill, so that the careful prepartions at the well were hardly completed when the little caval cade was halted by one of the guards who had arrived less than half an hour before. The order to halt obtained additional force from the presence of a huge tree trunk which had been felled across the rude road cut through the forest to the well, and behind the trunk stood the guard, leaning on his rifle.

The derrick and tank house were just visible through the trees, and they became objects of the most solicitous interest to the little band of information seekers. As they gazed, they plied the guard with easy questions about the well, the answers to which were about as full of information as those of the small boy who informed Dickens that the room in the prison formerly occupied by Little Dorrit was then tenanted by Tom Pythick, and in answer to the query who was Tom Pythick replied: "Joe Pythick's uncle."

Toward evening the trio of bold speculators who controlled the well rode away, exchanging friendly greetings and more answers of the Pythick order with the scouts as they passed. And when at last the black shadows of the night threatened to mingle with the gray shadows of the forest the scouts, too, turned their horses' heads down the hill and were soon lost to the sight of the guard. Not to gallop to the little town behind the trio already gone. Oh, no; but merely out of sight. Then, dismounting, they led their horses a little way into the wood, secured them, and crept stealthily back toward the mystery until close enough to see the lay of the ground without being seen or heard by the guards. Here they lay on the ground and waited patiently for the night.

Perhaps the belief that human eyes cannot see objects in the dark may have had something to do with these movements. At any rate, the guards who were relieved at midnight met their successors with the word that all was well, that no persons had been seen about the premises. And the other guards, when relieved shortly after daybreak for breakfast, reported a quiet, uneventful watch. True they had once or twice thought they had heard something moving about, but on listening carefully there was no sound louder than their own breathing, barring the plaintive notes of the blinking owls.

At that same early breakfast hour the dozen scouts were riding briskly along the forest road to the town. One carried a bottle filled with bright amber oil, another treasured a handful of oil saturated sand, and another triumphantly exhibited a tape measure, very oily at one end, from which dangled a little witch-hazel stick. And as they rode they talked and said how one had filled his bottle from the pipe, and one had gathered up the sand from where it had been deposited by the pump, and one had thrown his hazel twig into the tank, and it floating on the water at the bottom left the tell-tale stain, to tell the depth of oil, upon the tape. One had counted all the coils of rope wound around the bull-wheel shaft and knew how deep the tools had been, and one held his watch and timed the flows. All had dodged the guards, and held their breath while passing lest they should be heard. So, gaily on they rode, to telegraph their principals, and sleep, and eat, and feed the faithful beasts they rode.

That day the charm was working. The fate of millions hung upon the spell. On 'Change nothing else was talked of. In hotels and stores, club rooms and offices in distant cities, that mystery well was the theme for all. The question what the result would be when those plugs were drilled out was heard on many tongues, but none could answer.

The weeks following were grown as monotonous, almost, to the guardsmen, as those before had been to the drillers, except that the restless scouts came and went as the days and nights did, and in the oppressive stillness that had again fallen on the forest hilltop the wild things crept back again and awakened the echoes in the still night air with their cries. Then the guards began shooting to frighten the beasts away, not sorry if the random shots should render the scouts' incursions less frequent.

At last, when curiosity was at fever pitch, the workmen were sent back into the wildernest to drill out the plugs and open up the well. The trio of owners took up their quarters at the shanty, and the scouts came and went beyond the guard line, carefully noting every movement within the charmed circle. They conferred with their fellows, rode away and came back again. But day and night there were always two or three on watch.

The season was now late autumn. The day was one of those that begin with a light falling rain, swell to a furious downpouring, and ends with a dismal, soggy, chilly drizzle that always last through the

night, and seems to give way, reluctantly, to a cold, gray fog that retains the morning twilight until half the forenoon is spent. "Regular fine weather for a dog," as one of the scouts sarcastically soliloquized while his horse was toiling up a steep hill, floundering about in the deep mud and stumbling over the rocks that lay hidden in the path. The rain had then reached the stage of transition from gently falling to furious pouring, and the water already ran freely from the horseman's rubber garments.

By the time the ascent of the hill was accomplished on one side, and the descent on the other, the rain was descending in torrents, so the rider urged his horse to a gallop across the rude wooden bridge and along the muddy road skirting the base of the next towering hill. And when the well was finally reached the rain was still pouring down with un abated fury. Two of the scouts were there, plodding about in the rain. Glad of relief, they quickly posted the newcomer on what had been done during his absence, mounted their dripping horses and were gone, leaving him alone with his reflections.

Scout Bob—for by that name he was known—provided the best he could for his horse, sought a position where he could see the derrick, leveled his field-glass and sat on his mossy log hour after hour, until the rain had dwindled to a drizzle and the chill damp had gone clear through him to the very marrow. But he heeded not the elements, for he saw, through his powerful glass, the pipes leading to the tanks vibrate again and again with the fierce flows of oil, and he knew that the mystery was being solved. The plugs were out and the bit was cutting the porous rock.

When darkness had blotted the nearest tree from his view, he crept cautiously away toward the well. And many a time that night did Bob catch his breath at the first warning of the doleful hoo-oue-oo of the owl, fearing that it might be the beginning of less welcome words in the guard's voice. And many a time did his pulse quicken at the sharp report of a guardsman's rifle, and once he heard the whirr of the bullet close to his ear. That it was not intended for him did not compensate in the least for its dangerous proximity. "I might as well be shot on purpose as by accident, so far as I am concerned," he thought with grim humor.

Yet he did his work bravely and well, and was crawling away just as the first faint gleam of light began to color the black fog gray. But the guard was on his round, and blocked the avenue of escape. Bob crouched down beside a friendly log and watched for him to pass on. Minutes seemed like hours to him as he heard the trio at the shanty preparing for their departure. They would get out before he could, he thought, and that was agony. Still he dared not move. His employer might lose a fortune if he did not get out on time, make one if he did; but there was the guard right in his path and he on the wrong side of the guard line. He heard the horses saddled, heard them chafe their bits, impatient to start. Curbing his own impatience, he employed the time writing the telegrams he meant to send when he did get out, though not suspecting then what a wise action it afterward proved to be, and then he heard the horses start down the muddy road.

The guard turned to pass on. Bob leaped to his feet and ran, but, alas! his haste disclosed him. The guard was in pursuit, and was soon joined by his nearest fellow. Bob ran as if for life, and the guards, intent on delaying his departure, pursued hotly. He reached his horse, slipped the knot and was in the saddle, but so close were his pursuers that the foremost man touched his foot as he sank the spurs into his horse and was gone.

Away went horse and rider through the oozing mist at a mad gallop, leaving the chagrined guards to what consoling thoughts they might conjure up. But the trio were out of sight and hearing. Frantically the scout urged his steed to a wilder pace. Down the hill and into the valley. The stream was so swollen by the heavy rain that a film of water covered the road to the depth of several inches. Bob drew rein and listened. He could hear faintly the beat of horses hoofs ahead. Once more he galloped away. He was right on their very heels, when they drew up short. Bob and his horse went plunging headlong into the raging flood, unable to stop when they saw that the bridge had been washed away. Clear out to the middle of the stream, and then the poor beast floundered and went down Bob was out of the saddle, and in a moment man and beast were struggling madly for life with the turbulent waters. On the bank the speculative trio were transfixed with horror at the scene, and unable to give the slightest aid.

Getting hold of the bridle, Scout Bob directed the horse's head toward the opposite shore, and so in time they landed, completely exhausted. Bob sank to the ground and lay for some minutes as much dead as alive. Rousing himself after a time he sat up. His poor horse stood beside him, shivering still with fright, and barely able to retain its foothold on the steep bank.

Collecting his scattered senses, the daring stout remembered the object that had brought him there, staggered to his feet and laid his hand on the bridle. In another minute man and horse were carefully picking their way along the bank toward the road. The trio were still rooted to the other shore, but seeing with dismay that Bob would soon be on his way again, began to cast about for means to get across the creek, when one of the party remembered another bridge that could be reached by making a long detour.

Reaching the road, Bob mounted, turned, waved his hand to the trio, and then urged his horse up the hill at a painfully slow pace. On, on, the weary road seemed to have no end. Up the hill and down. As he turned in on the level road leading to the town he looked back, and there, coming over the crest of the hill, were the trio. The pursued were now turned pursuers, and the jaded condition of the oil scout's horse rendered the race well-nigh hopeless. Whip and spur goaded the poor beast to do its best, but the pursuers were fast gaining ground. At last the town was in sight, but the clattering hoofs beat louder and louder in the rear. As the scout turned up the street to the telegraph office they passed him, but he held on with the courage of despair, keeping close to them. The three leaped from their horses, without stopping to tie them, and rushed into the office. Bob followed in the same manner, and as the trio stopped to write their messages, the scout thrust his, already written, into the operator's hands. He had won the race after all.

Next day, when Bob rode out to the well on a fresh horse, in company with the trio and several fellow-scouts, he passed numerous wagons on their way to the wilderness laden with everything that goes before civilization, and when he visited the lonely hill again a fortnight afterward it was lonely no longer. A village had sprung up in the midst of the forest. Hundreds of men and scores of women and children peopled the spot. The wizp, wizp of the carpenter's saw was heard in the stead of the mournful hoo-oue-oo of the grave owl. A new oil field was opened, and the flush of excitement was upon it. The old derrick stood there with its blackened frame frowning down upon the new houses, but its secret had been stolen by the oil scout, and it was no longer the mystery well.

Returning to the group of scouts pictured for the readers of the *Express:* The young man standing next to Mr. Hughes is Joe P. Cappeau, one of the youngest of the scouts in years, but old in experience, having followed the business before the days of Cherry Grove. Mr. Cappeau has been successful. He is now a prominent producer of petroleum, of the firm of Craig & Cappeau, and is living comfortably in Pittsburg. In front of him at his left hand is Owen Evans, who followed the business long, and is now connected with the Philadelphia Natural Gas company, of Pittsburg. Standing beside Mr. Cappeau is Jule Rathburn, a well-known scout, now a producer and superintendent of oil properties at Kane, Pa. Sitting in front of Mr. Rathburn and next to Mr. McMullen is "Dan" Herring, who flourished in high-topped boots during the Cooper Hill and Balltown excitements. At last accounts he was owner and landlord of a hotel in a small town in New York. The remainig member of the party is John B. Drake, who is now a ranchman and stock owner in central Nebraska.

Mr. Hughes, who has already been mentioned, is living at Kane, Pa. He is superintending the properties of the Elk Oil company, of which he is a principal member. Mr. Tenant made $25,000 out of leases in the Macksburg, O., oil field in 1884, and a good bit at other places. He went to Kansas two years ago and settled himself on a very large farm, but with his old instincts still strong within him, he is now prospecting for natural gas in that State. A. R. CRUM.

BRADFORD, Pa., March 9.

Apostrophe to Natural Gas.

J. J. McLaurin, known to nearly every man in the oil country as "J. J. M." leads up to an account of the test well drilling for gas at Harrisburg in the following manner in the Harrisburg *Telegram:*

Natural Gas!

How the vapor-fuel has forged to the front the past five years with a stride the wearer of the Seven-League Boots might envy.

In Pennsylvania it has revolutionized many communities, giving many branches of business a new impetus, and adding immeasurably to the convenience and comfort of the people.

Who would recognize in the clean, smokeless Pittsburg of to-day the dark, dingy, shirt-soiling city which used to suggest fancies of the bottomless pit with the lid off?

The fuel Dame Nature has stored away in subterranean reservoirs during the ages has been tapped by the art of man, and is burning in myriads of stoves through-

out Ohio and the Keystone State. Thousands of furnaces are heated by it to an intensity unknown in the days of wood and coal. It glows and hisses beneath countless melting pots, which hold the stuff that is soon to appear as the finest glass on earth. It has solved the problem of manufacturing steel into which no trace of sulphur enters, setting Pittsburg on a pedestal above all competitors—unless they, too, shall be able to introduce the same marvelous combustible. It saves an incalculable amount of profanity on cold mornings by burning at any degree desired the whole night through, thus avoiding in legions of homes the unpleasant duty of "getting up before daylight to build fires." In short, its transformations are more wondrous than any ever conceived by Aladdin, or dreamed of by the most fanciful romancer in the "Arabian Nights."

Some other time the story may be told of the network of pipes that convey it from the wells to the cities, some of them many miles long and how the development has expanded until over $50,000,000 are invested in natural gas and its appurtenances. The "Eternal Fires of Baku" blazed in the days of Zoroaster, the devout Parsees worshiping them in holy awe as the symbols of the Sun-God, but it was reserved for this practical age to turn the gas to valuable account and make it subservient to the uses of the race.

If Toledo and Findlay in Ohio, Buffalo in New York, and Bradford, Oil City, Pittsburg, Johnstown and a score more places in Pennsylvania, can have all the benefits resulting from natural gas, why may not towns farther east? This question has been asked often, but never answered satisfactorily. Harrisburg is now actively trying to solve the problem and find out whether, away down under the surface of Dauphin county, the coveted fuel be stored in limitless quantity. People have supposed there might be gas in this latitude, yet did nothing. The only way to know this positively is by piercing the bowels of the earth.

The Refined Markets.

The markets for illuminating oil were much quieter during February than they were in January. Export oil, 70 degrees Abel test, was held firmly at New York, Philadelphia and Baltimore throughout the month at 7¾c. At this price the demand increased through the month, and while the clearances were not much greater than during January much more stowage was chartered, and toward the end of the month more vessels were being loaded. The clearances for China, Japan and other Eastern markets for the week ending Feb. 27 were greatly in excess of the same time last year, and the capacity of vessels loading and chartered to load was also considerably greater. The movement for European ports also showed greater activity toward the close of the month and indications were for further increase in the month following. Taken entire, the exports were larger than for the same month last year, though this is not a specially favorable showing, inasmuch as the February exports in 1887 were somewhat lighter than usual.

There was a further decline in prices for refined in the European markets early in the month and from lowest figures an advance during the latter days of the period. The fluctuations were not so wide nor violent as in January, and prices did not range so high as during that month. A New York writer had this to say of the situation near the close of the month:

There is now no disposition to withhold orders, as it appears to be the very general opinion that no decline may be expected. The sales reported for the past week foot up about 70,000 barrels. The price of 70 deg. Abel test has remained steady at 7¾c for all loadings. The principal foreign markets are again higher. To-day's quotations by cable are: Bremen, 7.15m; Antwerp, 20½f; London, 6⅝@6¾d, and Liverpool, 6¾@6⅞d. Freight rates have not changed and charters continue to be effected at very favorable rates. Hence to London, 1s 10½d is the average rate, though less has been accepted. To Continental ports 2s@2s 9d is about the range, as to port. Home trade lots have been in rather light request, but on these prices have remained unchanged and firm. We quote 8⅝@8¾c for State legal tests; 8@8½c for 110 test; 8¼@8⅜c for New York city 100 deg. flash, and 8¾@9c for 150 deg. water white. Western lots are held fully up to these figures.

Cases for export received little attention early in the week, but a later good demand set in and sales are reported amounting to over 300,000. The price has remained steady at 9¾c for plain tops. Freight rates continued with ample freight room offering. The rates for large vessels are: For Java, 30@31c; Japan, 29@30c; Calcutta, 20@21c; Bombay, 19c; Rangoon, 20c; Singapore, 22½@23c; Hong Kong, 23@24c, and for Shanghai 31@32c.

Crude in barrels for export has been in light request and only a few sales are reported. Prices have continued steady at 6⅞@7½c, for Bradford and Parker respectively. Cases for export have received some attention, with sales reported of about 40,000. Prices are unchanged at 8⅞@9½c.

Prime city naphtha has remained steady at 7c. For export there has been no demand and no sales are reported.

Western residuum, 42@51 deg. test, is quoted at 1½@1¾c f o b. Barrels are quoted at 5@5½. No sales are reported for export.

William H. Samuel & Co., of Liverpool, England, report the visible supply of refined petroleum on Jan. 1 as follows:

	Barrels.
Europe (7 Continental ports)	805,636
London	151,761
Liverpool	106,186
Total	1,063,583
Total Jan. 1	1,282,538
Decrease	219,955

The same parties, under that date, say of the present position and future outlook:

The advanced prices which marked the close of the past year, both for crude and refined petroleum, have been firmly maintained.

The apparent success of the shut-down movement in America has, as was expected, had the effect of sustaining prices of crude oil upon a much higher level than formerly, and the continued rapid diminution of stocks, as long as such reduction continues, must necessarily have a hardening effect upon the market. The reduced production of 27,515 barrels per day for November has, however, been followed by an increase in December to 41,568 barrels per day; but notwithstanding this, stocks have been reduced by 1,319,740 barrels. Prices of certificates have, since the opening of the year, hovered within a few points above and below 90c per barrel, against an average of 70c and 64⅝c respectively for January and February of last year.

Refined oil in America, after advancing early in the year from 7½c to 7¾c early in January, has since remained absolutely unchanged.

Home markets, and especially the London market, have, since the opening of the year, gone through some remarkable fluctuations. Owing to the prevalence for an exceptionally long period of easterly winds, a large number of vessels expected up in December did not arrive until well on into January, and in London stocks had become so limited that prices advanced to as high as 10d for ordinary brands. Here, however, stocks have not at any time been exceptionally low, and this market has not, therefore, been subject to any serious upward movement. Prices have, however, been firmly held at 7½d for best American brands, and 6¾d to 7d for Russian; and inasmuch as no further arrivals of any moment are expected for another month, no change appears likely to take place until then.

Mr. Geo. H. Lincoln's monthly circular gives the following figures on the clearances of refined petroleum, in cases, for China and the East up to the 29th of February for the years 1887 and 1888:

	1888 Cases	1887 Cases
China	180,820	310,157
Japan	255,525	399,165
India	117,926	446,754
Java, Signapore, etc	562,789	168,771
Total February 29	1,117,060	1,324,847

REFINED QUOTATIONS FOR JANUARY.

	New York	Philadelphia	Baltimore	Liverpool	London	Bremen	Antwerp
	Cts.	Cts.	Cts.	Pence		Reichmarks.	Francs
1	7¾	7¾	7¾	6⅜@8		7.60	18⅝@18¾
2	7¾	7¾	7¾	8		7.60	18¾
3	7¾	7¾	7¾	6⅞@7⅝		7.70	19 @19¼
4	7¾	7¾	7¾	6⅞@7⅝		7.70	19 @19¼
6	7¾	7¾	7¾	6⅞@7⅝		7.70	19¼
7	7¾	7¾	7¾	6⅞@7⅝		7.70	19⅛
8	7¾	7¾	7¾	6 3-16@7¼		7.45	19 @19⅛
9	7¾	7¾	7¾	6½@7¼		7.35	19¼
10	7¾	7¾	7¾	6½@7¼		7.35	19¼
11	7¾	7¾	7¾	6½@7¼		7.35	19¼
12	7¾	7¾	7¾	6½@7¼		7.35	19¼
14	7¾	7¾	7¾	6⅜@7⅛		7.20	19¼
15	7¾	7¾	7¾	6⅜@7⅛		7.10	19⅜
16	7¾	7¾	7¾	6⅜@7⅛		7.00	19⅜
17	7¾	7¾	7¾	6⅜@7⅛		7.00	19⅜
18	7¾	7¾	7¾	6⅜@7⅛		7.00	19⅜
20	7¾	7¾	7¾	6⅜@7⅛		7.05	19⅜@19½
21	7¾	7¾	7¾	6½@6⅝		7.15	19⅝@19¾
22	7¾	7¾	7¾	6 9-16@6¾		7.15	19⅝@19¾
23	7¾	7¾	7¾	6 9-16@6¾		7.15	19⅞
24	7¾	7¾	7¾	6½@6⅝		7.15	20 @20⅛
25	7¾	7¾	7¾	6½@6⅝		7.15	20 @20⅛
27	7¾	7¾	7¾	6 9-16@6¾		7.15	20 @20⅛
28	7¾	7¾	7¾	6 9-16@6¾		7.15	20 @20⅛
29	7¾	7¾	7¾	6 9-16@6¾		7.15	20 @20⅛

Somewhat Sarcastic.

The people of Northwestern Pennsylvania will observe with feelings of profound satisfaction the complete vindication of the Standard Oil Trust by the testimony given before the investigating committe in New York. These feelings of joy will not be overwhelmed by the surprise which will necessarily be felt at such a result. It now appears that the awful "Trust" agreement is (upon its face) as harmless a piece of paper to the petroleum trade as if the pen and ink had not traveled over it with that voluminous list of names. There have been no extraordinary favors granted by railroads to the Standard people, in the way of

freight rates; on the contrary, the Standard has frequently found itself discriminated against by a heartless railroad and a selfish competitor. Neither have there been any acts committed by which independent refiners have been driven from the business, though for some reason, the witnesses failed to add what is doubtless as true, that it has been the constant care and effort of the Standard Trust to nurse independent refiners into healthy life, and strew their paths with roses.

All this shows how much misaprehension may be made to exist by merely reading history. Let us candidly admit that hereafter nothing is, and that Napoleon and Wellington were not at Waterloo, and no battle was fought, while the absurd stories that have been told about Bunker Hill and Lexington are to be taken from the pages of history, and put into nursery literature along with Jack and the Bean Stalk, and Old Mother Hubbard—*American Citizen.*

Runs, Shipments and Stocks.

RUNS OR RECEIPTS.

PIPE LINE.	Jan. 1887.	Feb. 1888.
National Transit	803,536.82	896,260.69
Tidewater	96,658.54	114,017.67
Octave	1,931.32	2,185.66
Pittsburg	47,720.48	49,783.68
Southwest Penn'a	134,652.60	141,760.13
Western & Atlantic	36,948.40	29,567.84
Macksburg	16,257.33	18,860.76
Total	1,137,705.49	1,252,436.43
Daily average	36,700.18	43,187.46

In the above tables only oil received direct from the wells is taken into account.

DELIVERIES OR SHIPMENTS.

PIPE LINE.	Jan. 1887.	Feb. 1888.
National Transit	1,981,581.23	1,843,301.07
Tidewater	155,522.15	208,575.71
Octave	1,833.33	1,928.97
Pittsburg	47,879.40	49,825.47
Southwest Penn'a	35,559.11	23,394.51
Western & Atlantic	45,599.15	31,170.20
Macksburg	40,076.00	30,045.10
Total	2,308,050.37	2,188,241.03
Daily average	74,453.24	75,491.07

Daily average excess of shipments over runs:

February, 1888	32,303.61
January, 1888	37,753.05
December	43,271.79
November	43,863.54
October	21,078.16
September	10,502.53
August	8,973.79

NET STOCKS.

PIPE LINE.	Jan. 31, 1888.	Feb. 29, 1887.
National Transit	25,158,187,54	24,204,221.75
Tidewater	1,269,683.26	1,221,105.19
Octave	2,674.79	2,721.00
Pittsburg	130,338.84	131,466.80
Southwest Penn'a	253,897.54	372,263.16
Western & Atlantic	31,036.79	33,533.53
Macksburg	380,551.11	369,366.67
Total	27,226,369.87	26,333,678.10

Net stocks decreased:

February, 1888	892,691.77
January, 1888	1,130,703.67
December	1,300,415.55
November	1,249,321.18
October	482,993.39
September	293,299.48
August	284,874.16

	Runs.	*Shipments*
Daily average, February	43,187.46	75,491.07
Daily average, January	36,700.18	74,453.24
Daily average December	41,917.59	85,188.38
Daily average November	50,160.32	84,023 86
Daily average October	63,486.36	84,564.52

Crude Market for February.

The crude market during the greater part of February was a waiting one. The set back in January shook out much of the oil held by the public and a good bit of its confidence as well. The first half of February the trade was troubled with numerous rumors from the field and regarding the producers, and these served to keep the market in a nervous agitated condition. About the middle of the month the market was weakest and reached its lowest level. The latter part of the month and particularly the closing days witnessed a revival of speculation and more violent fluctuations, together with much larger clearances. The opening price of the month was 90⅞c, and the closing 93⅛c. The highest point was reached on the 27th at 95⅛c and the lowest on the 21st at 87¼c making the fluctuation 6⅞c as compared with 13c for January. The average price for February was 90c, as compared with 91 7-16c for January and 80c for December.

THE CLEARANCES.

Exchanges.	*Barrels.*
Bradford	31,164,000
Oil City	46,706,000
New York	107,830,000
Pittsburg	64,759,000

FUEL OIL PIPE LINES.

AN OUTLET FOR THE NORTHWESTERN OHIO FIELD TO CHICAGO AND PERHAPS TOLEDO.

It has been an open secret for three months or more that the Standard oil interest contemplated the construction of a pipe line from Lima to Chicago, and the first move was made in laying the connecting line from the Wood county field to the former city. It has also been known that other parties contemplated a line from Cygnet to Toledo, Scofield, Shurmer & Teagle, the wide-awake Cleveland refiners, being expected to furnish some of the capital and much of the practical experience necessary to the success of the project. Toledo capitalists, who believe that city to be the natural outlet for the Northwestern Ohio fields, less completely monopolized than the older producing regions East, are giving encouragement to the Toledo enterprise.

Perhaps the progress of this scheme may have stimulated the Standard to more rapid action than originally intended. The project for piping natural gas to Chicago and the figuring of the Westinghouse fuel gas people on supplying that city may also have acted as stimulants. Certain it is that contracts have been let for the Lima-Chicago lines and work has been begun. It is probable that the line may be extended from Chicago to Duluth, where the Standard recently acquired valuable wharf property as a preliminary to availing itself of the benefits of water transportation by the great river system of the country, as an offset to the operation of the inter-State commerce law in taking from it the unjust advantage of the customary special freight rates by rail.

The lively Lima *Gazette* has been looking up the scheme and says there are to be two lines, an eight-inch line to convey crude for fuel for manufacturing and industrial purposes, and a six-inch line for stove oil, which is to first go through the big Solar refinery at Lima to be deodorized as far as possible, and to have the benzine, naptha, water-white illuminant, and perhaps parafine extracted.

The following is from the *Gazette* of recent date:

Yesterday a car load of wire arrived over the Pittsburg, Fort Wayne & Chicago road for the Standard's telegraph line. It will be transferred to the Chicago & Atlantic and the work of putting it up begun. The Standard will not put up their own poles, but will stretch their wires on the poles of the C. & A. company. The pipe will be laid along the track of the C. & A. road as far as Englewood, Ill., a suburb of Chicago. Here large tanks are to be erected, and from here smaller lines will be built to Pullman, Hyde Park and the different suburbs of Chicago, and into the parts of Chicago that they are enabled to reach in this manner. The lines will be of six and eight-inch pipe, and branch lines to towns along the line are also contemplated, although no definite arrangements to that effect have been made. Messrs. A. Smedley and Wm. Fleming have been at the Lima House for two days arranging the preliminaries for the work, which will begin in a few days.

This line cannot fail to be beneficial to the field. It will enable them to furnish oil to Chicago factories at a price way below the price of coal, and it puts them 200 miles nearer St. Louis, Milwaukee, Minneapolis and St. Paul—points where coal is at a premium. Chicago alone, when the oil has been thoroughly introduced, can consume the entire product of the Ohio fields, even though the output should reach 60,000 barrels a day. It is bound to cause an advance in the price of crude, and a good time is not far distant.

Drilling and Knowledge.

Among the many improvements of modern times none are more important or show more real advancement than the mechanism for use in well-boring and rock-drilling.

Mining organizations and capitalists were quick to perceive the advantages which the diamond drill afforded in the direction of exploring new ground and prospecting in working mines, and at once availed themselves of the benefits thus afforded.

The wonderful activity in the oil fields and the wide-spread interest in natural gas gave a strong impetus to the demand for and manufacture of this machinery, and it may be truly said that the wide extent of oil and gas-bearing territory which has been made tributary to the world's advancement and need, is chiefly due to the excellence attained in the appliances used in prospecting and well-boring. Much money has also been saved by the record made and shown by the core of the diamond drill working in the face of a level.—*Chicago Mining Review.*

Not All Fuel Gushers.

Some of Wood county's peculiarities have been developed of late. It is well known from former events that it is not safe to calculate too strongly on the results of any given location. D. C. Brawley, on the Bryant lot, with an 800 barrel well west of him, a 400 north and a 500 southeast, with one of his own on the same lot doing 150, Saturday last obtained a dastardly miser of a well that would not spew 20 barrels a day in the natural state, and positively refused to flow after receiving an 80 quart shot of the Rock Glycerine's best. The well was drilled to 49 feet in the rock and stood full of oil all the time they were drilling below 20 feet in the sand. East of this well Steele & Hawkins have one doing 100 barrels a day, and just why this one should be a fizzle, to Brawley as well as others, is certainly not clear.

The Chapman & Blatchley well on the Sommers lot, at Trombley, when finished at 54 feet in Trenton yielded only 20 barrels a day. A shot was exploded in it

and it filled with salt water to the brim. It was tubed and pumped at once, and the second day after the operation commenced it yielded about 600 barrels of oil and on Saturday evening was still doing excellent work. It flows through the casing while they keep up an agitation with the pumps.

Farmer Dean purchased the Patty lease near the pump station, and Parke & Van Wormer's gushers, and while drilling got everything ready for a gush of 3,050 barrels a day. Three handsome 800-barrel tanks adorn the premises and so arranged as to be exceedingly convenient of access to those who wished to gaze at the "biggest well in Ohio." But the unexpected will happen, and to the Farmer this came with violent force. At 35 feet in the sand the well had but a small show and commenced caving from above, necessitating the insertion of nearly a thousand feet of small casing. This will delay its completion for some time. At that depth in the rock, however, the well should begin to show its hand if it ever intended to.

The Kirk well on the Roe tract was shot a week ago last Saturday and flowed 500 barrels the following 24 hours, and in four days thereafter suspended business and gave no reason for its strange action. It will be tubed.

Tate's No. 3, on the Arter purchase, and directly opposite to the Smith and Ziegler well, Boe farm, which latter is said to yield 300 barrels a day, is in the sand a sufficient depth to make a fair report, but as yet it fails to respond. The No. 2, one location north, started at 500 barrels, but turned roily after a three days' run.—*Cygnet Correspondence Lima Gazette.*

February Production Report.

Reports of the stocks at wells in the Bradford field received by THE PETROLEUM AGE show a decrease of .43 barrels to the well during the month of February. Stocks reported at wells in the Allegany field show a like decrease of 1.4 barrels per well. The total number of wells connected with the pipe lines in the Bradford field on February 1, was estimated at 14,100 and the number in Allegany field 4,000. From the above data it is found that the average daily decrease in stocks in the Bradford field was 209 barrels. In the Allegany field it is ascertained by the same computations that the stocks at the 4,000 wells decreased 193 barrels per day. The average daily pipe line runs from the Bradford field were 13,854 barrels and from the Allegany field 3,413 barrels. Subtracting the daily decrease in stocks from the pipe line runs the figures are tabulated as follows:

February daily average Bradford runs	13,854
" " " Allegany "	3,413
Total runs both fields	17,267
Decrease Bradford stocks	209
" Allegany "	193
Daily decrease both fields	402
February's estimated daily production Bradford and Allegany fields	16,865
January's estimated daily production Bradford and Allegany fields	14,972
Increase in February	1,893

JANUARY PRODUCTION REPORT.

Reports of the stocks at wells in the Bradford field received by THE PETROLEUM AGE show an increase of 1.15 barrels to the well during the month of January. Stocks reported at wells in the Allegany field show a like increase of 3.1 barrels per well. The total number of wells connected with the pipe lines in the Bradford field on December 1 was estimated at 14,100, and the number in the Allegany field 4,000. From the above data it is found that the average daily increase in stocks in the Bradford field was 523 barrels. In the Allegany field it is found by the same computation that the stocks at the 4,000 wells increased 400 barrels per day. The average daily pipe line runs from the Bradford field were 11,329 barrels, and from the Allegany field 2,620 barrels. Adding the daily increase in stocks to the pipe line runs the figures are tabulated as follows:

January daily average Bradford runs	11,329
" " " Allegany "	2,620
Total runs both fields	13,949
Increase Bradford stocks	523
" Allegany "	400
Daily increase both fields	923
January's estimated daily production Bradford and Allegany fields	14,972
December's estimated daily production Bradford and Allegany field	15,070
Daily decrease in January	98

WARREN, FOREST AND LOWER COUNTRY.

Reports were received from groups of wells in the different sections of Warren, Forest and the Lower Country. The number of wells on the 1st of each month, with their averages, are contained in the following statement:

	No. wells Feb 1	*No. wells M'ch 1*	*Av. per well Feb 1*	*Av. per well M'ch 1*
Clarendon and Tiona	75	67	24	18
Cooper District	147	125	31	14
Lower Country	172	202	38	30
Miscellaneous	22	38	11	49

As Macksburg oil is used in the same way as that of the fields of New York and Pennsylvania, there is no good reason why the Macksburg runs should not be counted in the runs of the oil regions. Hence they are included in the outside runs for January and February in making the following estimates on production:

Field.	*January. Barrels.*	*February. Barrels.*
Bradford and Allegany	14,972	16,865
Outside Runs, including Macksburg	22,751	25,920
Total	37,723	42,785
Increase	5,062	

Compared with the month of February, 1887, there is a decrease of 22,000 barrels. The average daily production for the month of February 1887, including the Macksburg field, was 64,785 barrels.

In the above estimates no account is taken of the "dump oil" loaded on the cars direct from the wells at Emlenton and other points in the region. The Lima runs by the Buckeye pipe lines were 11,081 barrels a day in January, 14,583 barrels a day in February.

The following table shows the comparative production of the New York, Pennsylvania and Macksburg, O., oil fields for 1886, 1887 and 1888:

	1888.	1887.
January	37,723	64,429
February	42,785	63,724
	1887.	1886.
January	64,429	57,272
February	63,724	57,840
March	63,392	59,764
April	63,447	63,027
May	63,253	68,198
June	62,275	74,454
July	60,005	73,887
August	59,121	76,657
September	60,145	78,228
October	58,942	77,009
November	42,414	72,695
December	40,390	67,790
Total	701,537	826,821

RAILROAD DISCRIMINATION.

TESTIMONY IN THE LOGAN, EMERY & WEAVER SUIT BEFORE A MASTER.

WHEN Logan, Emery & Weaver's Philadelphia refinery was sold to the Standard it was stated that the suits instituted against the Pennsylvania railroad company for $300,000 in rebates and drawbacks against the refining company would not be dropped. This promise is borne out by recent proceedings. The hearing of the case began before Master W. M Dame, in Titusville, Tuesday, continuing for three successive days. There appeared for the plaintiffs Messrs. Sherman & Grumbine; Lee, Hastings & Criswell; Elliott, Jack & Roberts, and for the defendant J. Ross Thompson, Esq. The evidence showed conclusively that the Pennsylvania was guilty of overcharges to various independent refiners, and upon demand paid back the excess over that allowed their competitors in the ring. The hearing will be continued in Oil City, Franklin, Pittsburg and Philadelphia at various times during April. The following is the full report of the testimony as furnished by the stenographer:

J. M. Witherop, a witness, being produced and first sworn, deposes and says: I reside at Titusville, Pa.; I am in the business of refining petroleum under the firm name of Rice, Robinson & Witherop; our works are on South Monroe street, in Titusville; have been in the refining business since 1881; began to run the works in 1881; in my business have had occasion to ship refined oil eastward over the Pennsylvania railroad, in the custody of the "Green Line" of the Pennsylvania railroad; shipped to all points in the State, Philadelphia, Harrisburg, Scranton, Mauch Chunk, Baltimore and other points; shipped from the first of January, 1882, to the present time; shipped in both tank cars and barrels: the tanks were owned by the Green Line or by the railroad; did not use our own tanks; the rate to most of the points in the State of Pennsylvania which were on the line of the Pennsylvania railroad was forty-five cents per barrel; the rates to Baltimore and Philadelphia were forty-five cents; Communipaw, fifty-two cents; my recollection is that the rates in 1882 were about two cents per barrel lower than in 1883; they were lower than some time later but can't state the exact time; my impression is that in 1883 the rates were raised to the present rates; the rates now are the same as they were immediately after the change that I have mentioned; in 1884 and 1885 the rates were the same as now, also in 1886-7 as I believe.

Question—State whether or not you, at any time, ascertained that you were or were not paying a greater rate of freight per barrel, to the points you have named, than any other person, or some person, and if so what person or corporation, and how much greater if anything?

(Objected to as irrelevant and immaterial, as witness is not a party to the suit and further that is hearsay and not competent.)

Answer—We understand, in the year 1886 the Bear Creek Refining company and the Union Refining company, of Oil City, had been made allowances on their shipments over this line (the Green Line) which had the effect upon us and resulted to us in making over charges to us of the freight we paid. This allowance was thirteen cents a barrel. This

thirteen cents was the amount of the overcharge to us. Upon receiving this information we made a statement to the railroad company of our shipments for a time covering a period of about, from from the first of January, 1882, to and inclusive of December 31st, 1884. That statement was forwarded to the Pennsylvania railroad company at Philadelphia, accompanied by a bill for overcharge to the amount of thirteen cents per barrel, for each barrel represented in the statement referred to, with the request to put the same in course of payment as soon as possible.

(Foregoing objected to as irrelevant and immaterial.)

Q. State whether or not, the demand of payment which you made, accompanied by your statement, resulted in any correspondence with the Pennsylvania railroad officials, and if so with whom?

(Objected to as immaterial and irrelevant.)

A. It did. John Whittaker, local freight agent of the Pennsylvania railroad at Philadelphia answered the letter. No one else I think.

Q. State what was the result of this correspondence, so far as it involved an admission or denial by the Pennsylvania railroad company, of the truth of your previous statement to them, relative to overcharges for freight.

(Objected to as irrelevant, immaterial and for the further reason that there is no evidence that Mr. Whittaker was agent for, or had authority to bind the Pennsylvania railroad in the premises, and that the correspondence itself would be the best evidence and being in writing should be produced.)

A. It resulted in the final admission of the validity of our claim, after striking off the interest which was included and the western shipments which were also included. I wish to correct that testimony and say that it resulted in an offer of a certain amount in compromise of the claim. My recollection is that that offer was refused. I think afterwards there was some further correspondence before anything further was done. (Objected to as the correspondence would be the best evidence.) My recollection is that the offer of compromise was raised somewhat and which we accepted.

Q. State whether any payment was made and if so by whom and to whom?

(Objected to as incompetent and irrelevant.)

A. There was a payment made to us on the accepted compromise, made by John Whittaker to the best of my recollection. It was paid by an order on the Treasurer of the Pennsylvania railroad company. We never heard anything from it after it was deposited in the bank. I think it was $3,600. I don't know whether the correspondence referred to is in our custody or not. Think it could be available.

Q. State upon what basis, as to the rate of freight ber barrel, the settlement with the Pennsylvania railroad company was made?

(Objected to as irrelevant and immaterial.)

A. Thirteen cents per barrel.

Cross-examined.

I am not interested either directly or indirectly in this suit, except that in view of the success of the plaintiffs we might be induced to act; we shipped both refined and crude oil over the Green Line; the place from which we shipped our crude was a nearer point than those mentioned and we had a lower rate; the shipments that I have testified to were principally refined oil and products of crude oil; those shipments were from Titusville, Pa., where our works are located. The Pennsylvania railroad has no proprietary or owned line at Titusville. If I am correct in believing the Allegheny Valley railroad to be a leased line of the Pennsylvania railroad, Oil City would be the nearest southern point, about eighteen miles; Union City or Corry on the north about twenty or twenty-seven miles respectively to the Philadelphia & Erie railroad; the distance from Titusville to Pittsburg by rail is about 150 miles; our firm commenced operating and manufacturing oil about the latter part of 1881 or beginning of 1882 and from that up to 1886–7 we were shipping refined oil along the various points of the Pennsylvania railroad and its leased lines; the shipments in 1881. I should say, were very light, possibly not more than a few hundred barrels; could not give a correct idea of the amount shipped in 1882 of refined oil or product of crude petroleum, nor in 1883; never separated the periods; we just took the gross amount between certain dates; in 1882, 1883 and 1884 the refined oil was largely shipped in barrels; it was customary to have from 48 to 52 gallons to the barrel; in shipping in tank cars 50 gallons are allowed to the barrel; in shipping refined oil in barrels there would be the the same number of gallons approximately as by tank; the barrels average about 65 or 67 pounds in weight; when shipped in packages or barrels no charge is made for the weight of the package or barrel; the Bear Creek Refining company is near Pittsburg, Pa.; can't state where the Bear Creek Refining company obtained their crude oil; can't say where they get it; Mr. Whittaker's office is in Philadelphia, I think; I am not very familiar with his position, but should say he was called the local freight agent, with his office at Philadelphia; I believe that John S. Wilson was the general freight agent during these years; my recollection is that although our correspondence was directed to him, that Mr. Whittaker took up the reply; I don't know that the letters and correspondence are in this city at the present; I believe we took letter press copies of all our letters to Mr. Wilson; I think I could produce copies of all these letters and replies to them; I will produce them if I can; this correspondence took place in the latter part of 1886, I believe; our claim was the result of the aggregate business for several years at that time; our claim was accompanied with a demand of reimbursement, I believe, and we were paid the gross sum of the compromise by what we would call a check upon their treasurer.

Re-Direct:

My impression is that the check was signed by Mr. Downing, the Comptroller of the Pennsylvania railroad; in making our claim no recognition was taken of the number of gallons, but of barrels; we may have shipped a few barrels of crude oil East, but none of any consequence; I desire to explain that in speaking of the number of gallons allowed to the barrel, whether in packages or in tank cars, that my impression is that since I have been in the refining business the allowance of gallons per barrel has been two different quantities, but I also believe that the allowance both in tanks and barrels as to number of gallons has been at all times the same. (Signed)

Frank L. Wood, a witness, being produced and sworn deposes and says: I I live in Titsville, Pa.; am in the business of refining petroleum; have been in that business since 1883; began shipping in 1883, possibly the latter part of 1882; my works are located at the foot of Second street in Titusville; I shipped oil by the Pennsylvania railroad, or by the Green Line rather, since 1882 or 1883, to New York and Philadelphia, Perth Amboy and a little to Boston, some to Wilkesbarre and Scranton; shipped mostly by barrels; I paid forty-five cents freight per barrel to Philadelphia and fifty-two per barrel to New York; the barrels were reckoned as packages; there was a short time, a few days, I believe, within the last two years, that they made a rule calling a barrel fifty gallons.

Q. State if at any time you made a demand on the Pennsylvania Railroad company that it should refund to you any sum as an overcharge of freight made to you per barrel upon your shipments over its roads? (Objected to as irrelevant and immaterial and witness is not a party to this suit).

A. Yes, sir, in the latter part of 1886 for a claim of thirteen cents per barrel upon all shipments up to Dec. 31, 1884, and the claim was paid in December, 1886, or fore part of January, 1887. The claim was made by Mr. Whittaker and it was paid by a check or draft on Philadelphia. Think it was made payable at some bank The check or draft was drawn in behalf of the Pennsylvania railroad or some official of the road.

Cross-examined:

I was the proprietor of my works doing business as the Oil Creek Refining company; commenced shipping oil in 1882 or latter part of 1881; shipped refined oil; think the Green Line makes the same rates East for shipping oil in tank cars or in packages; the Western shipments go by the hundred.

Q. Could not the railroad company ship oil to better advantage in tanks than in barrels or packages, thereby saving the transportation of the dead weight of the package? (Objected to as not lawful cross-examination).

A. No, I think they could handle it in barrels the easiest and most economical, because they could load the cars back, the racks and do it. The barrels weigh from 65 to 70 pounds each. My oil was principally shipped in barrels. Could tell by referring to my statement how many barrels I shipped in 1883. I have it in my office, or a press copy of it. Could not give any idea of the number of barrels shipped in 1883 without a reference to the statement, nor 1884. Could not tell how much was shipped to New York, Communipaw delivery, in 1883, 1884, nor of the number of barrels shipped in those years to Philadelphia. The price to New York was fifty-two cents and to Philadelphia forty-five cents per barrel. I shipped some oil to Wilkesbarre and Perth Amboy. The price to Wilkesbarre was forty-five cents and Perth Amboy fifty-two cents. Same rate as to New York. The only correspondence I had with the Pennsylvania railroad was that I sent on my claim, and after they had cut off the claim my charges for western shipments, I was paid. I addressed my correspondence to Mr. Whittaker. My impression is that he was first or second Assistant General Freight Agent of the Pennsylvania railroad at Philadelphia. The statement I sent was the gross statement of my en-

tire Green Line shipments east and west, in gross up to December 31st, 1884. This statement was accompanied with a demand for payment. I simply said that there was an overcharge and demanded payment. Did not say that I would bring suit unless same was paid

(Signed.)

John Schwartz, a witness being produced and sworn, deposes and says: I live in Titusville; am engaged in the business of refining oil and have been in the same since July, 1882; my works are in Titusville; have shipped oil eastward over the Pennsylvania railroad every year since we started, up to the present time; we shipped to Communipaw, N. J., Philadelphia, Baltimore, Harrisburg, York, Millersburg and to all Green Line points; in 1882 we paid fifty-two cents to Communipaw and forty-five cents to Baltimore and Philadelphia per barrel as freight.

Q. State whether you, at any time, made a demand on the Pennsylvania railroad company that it should pay back to you any overcharge of freight paid by you per barrel on crude or refined oil shipped by you over its road, and if so, for what amount per barrel and upon what shipments and for what years?

(Objected to as incompetent and irrelevant.)

A. I made demand on them for thirteen cents a barrel on all shipments of refined product I made over their line, from the time I started until the first of January, 1885. The shipments ran from October, 1882, to January 1, 1885. That demand was paid. I got a check from the Pennsylvania railroad company or its officials, can't recollect exactly who signed it. It was either a check or a draft on the treasurer of the company. It was paid about November 1, 1886. The amount of my claim was $1,766, but they deducted something for shipments made to Philadelphia Lubric company, $146 and some cents. They claimed that the Philadelphia Lubric company was the party to whom the deduction should be paid. My exact claim, $1,766.57, and the amount deducted was $146.79.

Cross-examined.

Am operating in refined oil and petroleum products; I am not operating in crude oil; my place of business is Titusville, Pa.; I know noting about the Pennsylvania railroad having any roads leading into Titusville, except that they make rates. The names of the present railroads are W. N. Y. & P. railroad company, formerly called Buffalo, New York & Philadelphia railroad company, and the D. A. V. & P. railroad company. I do not know anything about the latter road belonging to the Vanderbilt system. The nearest point to any railroad operated or owned by the Pennsylvania railroad is Youngsville, Pa., on the line of the Philadelphia & Erie railroad. The Pennsylvania railroad does not own any road or leased road running into Titusville to my knowledge. It has an office here.

Q. Do you know as a fact, that the Pennsylvania railroad company has no railroad line or leased line running into Titusville?

A. No, sir. I don't know as a fact that they have any road running into Titusville.

Q. Is it not a fact that freight shipped from Titusville would have to pass over other railroads not owned or leased by the Pennsylvania railroad, before striking the leased lines or roads operated by the Pennsylvania railroad?

(Objected to as not being cross-examination.)

A. Yes, sir.

Q. Would not freight shipped from Titusville to the eastward, have to pass either over the D. A. V. & P. to Irvington, or over the W. N. Y. & P. to Oil City before striking any of the leased lines of the Pennsylvania railroad and operated by that company?

A. Over the D. A. V. & P. to Irvington and the W. N. Y. & P. to Corry. The Pennsylvania railroad company has no road leading into Titusville or controlled by it, to my knowledge. Cannot tell how much oil I shipped to Philadelphia in 1883 nor how much to New York. Have nothing here by which I can give data. I made my demand for reimbursement for overcharges in 1886 of Mr. Whittaker in writing. The demand was in the form of a bill for a gross sum of seventeen hundred and odd dollars as stated. That was in writing, the bill accompanied by a letter—that was paid.

Q. Was not your demand accompanied by a statement that unless paid suit would be brought?

A. My demand was made for an overcharge and was only a simple request for reimbursement.

Q. Before you received the check you speak of, did you not write that unless paid you would bring suit?

A. I have no recollection of threatening them with a suit.

Re-direct.

The Green Line has an office in Titusville and an agent in charge of it; they receive freight here for shipment over the Pennsylvania railroad.

Re-cross-examined.

I have no recollections of corresponding with any one except Mr. Whittaker. The witness says: I desire to explain that at one time the rates to Communipaw, were forty-eight cents per barrel and to Philadelphia and Baltimore forty-two cents; don't recollect just when it was changed.

Re-direct:

I have no recollection of directing any communication to anyone except Mr. Whittaker, of the Pennsylvania Railroad company.

Re-cross-examined:

I shipped both by tank cars and in packages; by tank cars there was allowed at one time forty-five gallons to the barrel which was afterwards raised to fifty gallons; I don't know when that change was made; there were no number of gallons specified when shipping by the barrel; I should think that forty-two gallons would constitute a barrel; a barrel weighs from sixty to seventy pounds.

Re-direct:

In billing freight the barrels sometimes varied from forty-five to fifty gallons; we never specified the number of gallons; in shipping oil by the Green Line, it was considered at one time forty-five gallons to the barrel and was afterwards raised to fifty.

Re-cross-examined:

In the tank cars it was not billed at so many gallons, but at so many barrels; at one time forty-five gallons was allowed to the barrel and afterwards fifty gallons.

Practically Free Gas.

In order to prevent a monopoly by the Southwest company, the Fayette Fuel Gas company has decided to offer free gas to the citizens of Uniontown, as well as to all others who may be induced thereby to become citizens; natural gas for domestic and manufacturing purposes absolutely free, so far as any profit to said company is concerned. The condition to the above tender, briefly stated, is this: If the borough will equip and maintain an entirely new plant of sufficient capacity for supplying the same, the company will furnish gas to all consumers at actual cost for service. This cost, divided among consumers proportionately to the number of fires burned by each, would reduce the price of gas to a mere nominal sum per fire per month —only a few cents—instead of the exorbitant rates now charged. The offer has been accepted by a vote of the citizens.

SHOOTING OIL WELLS.

THE EXPERIENCE OF CLARK ROBINSON, THE "GLYCERINE FIEND."

CLARK ROBINSON is what many have seen fit to term "a glycerine fiend." He has pursued the business of oil well shooting for fifteen years and is as thoroughly familiar with all the ins and outs, ups and downs and dangers of the occupation as any man living. More than that, he has had some experiences during his day that appear marvelous to the average person who never jumps into danger or enters a path of life where the odds are against his escaping with his life.

It is perhaps unnecessary to relate the exceeding speed with which things material are dispatched into nothingness by nitro-glycerine in action. And it is presumed that all are aware of its peculiar sensitiveness to a sudden touch or blow from some more compact material. Nevertheless, it is handled without difficulty in quantities ranging from forty to 200 quarts, contained in tin or zinc cans of about one gallon capacity each. These cans are nicely packed in a box in a carriage made expressly for the purpose, each can having its own individual apartment, tight fitting, so that no motion of the vehicle will cause a motion of the can or force it in contact with another. With quantities to suit the demand of the well owners, varying as above, these wagons are driven over all kinds of roads and into every corner of the country where oil is produced or wells drilled. It is not unusual for an order for a "shot" to be received from a distance of 100 miles, and often the "fiend" will start and travel night and day over rough and smooth highways and will arrive on time or kill a team in the attempt. Practice makes perfect, it is said, and in the handling of this material the rule works as nicely as in any other branch of business. When first used glycerine was hauled in wagons not so perfectly constructed or arranged as above pointed out. The cans were bunked together in a bundle in the wagon box and many an unfortunate shooter forfeited his life as a result. Accidents were numerous, but of late years have been quite exceptional, owing, as stated, to the improved condition of the vehicles used. It was prior to the date of the improvement that Clark Robinson had a thrilling experience.

The story as told by him is as follows: "I received an order one evening to shoot a well on the hillside, away up on the east side of Kendall creek. I went to the magazine for my load, but was delayed in obtaining it, owing to the fact that the last run made at the factory had not been

completed. Finally I got started. The roads were then exceedingly rough, and knowing this fact I was more than usually careful in packing the cans in the horse blankets. I had not proceeded very far till, looking ahead, I beheld a team of horses coming toward me on the jump. They were attached to a lumber wagon, having no box or anything else on it. They were evidently running away, I concluded, for I could see no driver in charge. The hind wheels were bobbing around from one side of the road to the other, and of course I lost no time in measuring up my danger.

The road was ditched on both sides at that particular locality, and it was the only quarter of a mile of pike between Tarport (I lived there then) and the ridge or summit, five miles distant. However, I cracked my whip over the horses and made for the ditch on the left side, as I saw the runaways were keeping pretty well to my right. Up they dashed, but seemed to slacken their speed as they approached me.

"I positively believe they wanted somebody to head them off, for, strange as it may appear, they turned directly toward the side of the road that I had selected to escape them. What should I do? I had no time to jump and run from the scene before a collision would occur, and when it did an explosion would certainly result. Fortunately when within fifteen feet of my horse they plunged into the ditch just in front of me and tumbled one over another, breaking the wagon pole and upsetting the vehicle, one wheel of which reached out just far enough to strike the rim of my right hind wheel. My wagon and horse stood kind of sideways across the ditch. I sat still in my seat for a minute and heaved a few short sighs, and then proceeded to remove my load and regain the centre of the highway. It was not ten minutes till the owner of the team in company with two others, came up and removed the wreck.

"By this peculiar event I was delayed somewhat, but I started again, hoping to make my destination without further trouble, but I was doomed to disappointment in this. I got along well enough till I came within twenty rods of where I intended to halt, near the well I was to shoot. It was on a rather steep hillside. Steam was blowing off at the boiler, and I noticed that my horse did not like to pass it, but I desired to drive between the boiler and the engine house, there being perhaps thirty feet of room. When I approached the boiler my horse wheeled about as if shot in the nose, making the turn on the low side. In less time than it requires to relate it I was thrown from the seat and lit right under the horse's front feet.

"About this time I realized my great danger and everything I had done or thought of in my life dashed out before my vision, but I just concluded I'd stay with the concern, and so grabbed the horse by the bits as I lay and was being trampled by him in his efforts to escape, and he left marks on my limbs that I'll carry as long as I live. I could not hold him as I had not time or ability yet to regain my feet. The wagon upset, depositing the glycerine cans on the solid ground, which proceeded to roll over one another, each can making at least four revolutions on the hillside before the final halt was made. At this juncture the horse became detached from the wagon, and regaining his feet started to run. I pursued him, and to my astonishment found him standing stock-still not forty rods away.

"The workmen at the well saw the performance, and when they beheld me running after the horse called out: 'My God, man, ain't you killed?' I replied. 'Not by a d—d sight,' and proceeded with my work. I perhaps could not undergo a similar experience once in forty lifetimes and come out as safely, but I am a strong believer in fate, and therefore do not expect to pass in my checks till my time arrives. What I have told you is every word fact. The well was shot by the same glycerine on the following morning, and not until the go-devil descended did I have faith to believe that the work would be accomplished without accident. In that, too, I was disappointed.—*Philadelphia Times.*

Investigating Liars.

The committee appointed by the Bradford Oil Exchange to investigate as to the origin and circulation of the lie that Butler district had withdrawn from the Producers' Protective Association, submitted its report on March 17, which, in brief, exonerated all members of the Bradford Exchange in accordance with the testimony. The members charged with complicity in its circulation made full statements as to where they obtained their knowledge and laid their telegrams and correspondence before the committee. Some of the twenty witnesses examined did not clear themselves so fully, their testimony being vague and contradictory. By reference to the seventy-two pages of testimony it is learned that a telegraph operator in the Postal company's office heard a query going from Butler to New York papers asking them how much news they wanted of such a secession. The operator first told E. A. Durham, who paid no attention to the matter. It appears that he then gave the information to the *Era*; that Mr. Snell, of that paper, repeated it to Durham and G. W. McMullen; that they conveyed the information to A. Fraser; that Mr. Fraser, being charged by the *Era* with connection with the rumor, asked that a meeting of the Exchange be called and an investigation made. The statements of Messrs. Durham and Fraser before the committee are very full and corroborated by their letters and telegrams on the subject, fully relieving them of any suspicion of dishonest connection with the rumor.

The testimony was not given to the press, but is the property of the Oil Exchange. Members of the Exchange have access to it, and the facts given in the AGE were obtained from persons wholly above the suspicion of dealing in ficticious information or shielding those who do. The committee, after careful consideration of the testimony, came to the conclusion that no member of the Bradford Exchange, nor any other person in Bradford, so far as it could learn, had anything to do with originating the rumor and very properly reported accordingly.

STANDARD people are busy denying the report that they intend to pipe Lima oil to Chicago. The Standard is the great negative concern of this country. Nearly half its time is devoted to denying reports and charges concerning it, either on the witness stand or through the columns of its subsidized press. But in the face of wholesale denial it has been convicted of about every species of villainy in the commercial calendar.

Our Exports.

The people who have been making much noise about decreasing exports may be interested in the following official table from the Bureau of Statistics. True it only comes down to June 30, 1887, but it will be remembered that the last half of last year showed a gratifying increase over the corresponding period of 1886, which is that much toward showing continued increase, being the first half of the current fiscal year. The first month of the last half shows a decrease and the second an increase, the two together a slight net decrease. There is yet no indication that the year will show a decrease. We give the official tables and remarks of the statistician:

Year ending June 30.	—Illuminating mineral oil.— Gallons.	Dollars.
1864	12,791,518	6,764,411
1865	12,722,005	9,520,957
1866	34,255,921	18,626,141
1867	62,686,657	22,509,466
1868	67,909,961	19,977,870
1869	84,403,892	27,636,137
1870	97,702,505	29,864,193
1871	132,608,955	34,138,736
1872	122,539,575	30,566,108
1873	158,102,414	37,195,735
1874	217,220,504	37,560,995
1875	191,551,933	27,030,361
1876	204,814,673	28,755,638
1877	262,441,844	55,401,132
1878	289,214,541	41,513,676
1879	331,586,442	35,999,862
1880	367,325,823	31,783,575
1881	332,283,045	34,317,695
1882	488,213,033	44,588,854
1883	419,821,081	36,926,574
1884	415,615,693	38,195,349
1885	458,243,192	40,074,827
1886	469,471,451	40,634,331
1887	480,845,811	37,303,997

It will be seen from this table that the exports of illuminating mineral oil, with few fluctuations, have steadily increased during the years mentioned, reaching the highest point in 1882, when they amounted to 488,213,033 gallons, valued at $44,588,854. During the fiscal year 1887 we exported in round numbers 481,000,000 gallons valued at $37,300,000.

Burning Oil Like Coal.

Those interested in the utilization of petroleum products as fuel in a wider range of conditions, have for some time back seen that if it were possible to make it in solid shape, for easier transportation and handling, without thereby injuring its combustibility, it would be a great point gained. The *Revue Scientifique* gives a report of some recent experiments by Dr. Kauffman, a Russian scientist, looking to this end. He has obtained the best results by heating the oil with one to three per cent. of its weight of common soap for about half an hour. At the end of this time the soap is entirely dissolved, and the whole mass is at once converted into a solid material, of the consistence of tallow Cut into pieces in the shape of bricks, the petroleum thus solidified ignites only with difficulty; but, once lighted, it burns slowly, without smoke, leaving about two per cent. of black, odorless residue. Compared to that of coal, its combustion is one-third as rapid, and the quantity of heat produced would be far superior, when the draught is well regulated. In this state petroleum can be used in ordinary grates, or at least but slight changes would be required.

THE handsome illustration adorning the first page of this issue is a specimen of the excellent work of Matthews, Northrup & Co., and with the accompanying article first appeared in the Buffalo *Sunday Express* of March 11.

THE PETROLEUM AGE.

DEVOTED TO THE INTERESTS OF THE PETROLEUM TRADE.

PUBLISHED MONTHLY BY
J. C. McMULLEN, BRADFORD, PA.
A. R. CRUM, EDITOR.
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CURRENT COMMENT.

THIS picturesque oil region of Pennsylvania is as full of fond memories as it is of blackened derricks.

***

VAST aggregations of capital are no more necessary to the welfare of the rock oil industry than to the business of wheat growing.

***

THE New York Senate investigating committee has reached the conclusion that the Standard Oil Trust is a beneficent institution. From the easy, greased way in which the Standard magnates were examined this was to be expected.

***

GEORGE RICE, of Marietta, has received the order of the Inter-State Commission, forbidding railroads to discriminate in favor of tank car oil shippers. Mr. Rice has made a noble fight against the Standard monopoly, and all honest men rejoice in his victory.

***

ONE of the Staudard Oil Company millionaires has died in Florida. If that glorious climate would prove fatal to the Trust, the people would, no doubt, petition its speedy removal from 26 Broadway, New York, to Mr. Flagler's palatial hotels at St. Augustine.

***

WHEN producers of petroleum cease to burden their industry with the onerous burden of storage charges on vast surplus stocks, stop crowding lines, paying unreasonable bonuses and rushing developments with the haste that makes waste, they will be surprised at the increased profits without advance in price to consumers.

***

THE short seller of oil has been more abused the past six months than ever before. In a spirit of fairness, we may inquire whether some of this blame should not attach to the short buyer of oil, who puts up 5 to 10 per cent. cash and has to have a short seller as a tender to put up enough more margin to enter the oil in bank as collateral.

***

Some maliciously inclined persons have been loud in their declarations that the consumption of American oil in Europe is decreasing. During the fiscal year ending June 30, 1887, we exported more oil than the previous year. From June 30 to Dec. 31, 1887, our exports showed an increase of over 5,000,000 gallons over the corresponding period of 1886. From Jan. 1, 1888, to March 1, exports showed a decrease of nearly 3,000,000 gallons as compared with the same time last year. But stocks in foreign ports for the same period have decreased 13,000,000 gallons, leaving a net increase of 11,000,000 gallons in our favor.

***

INDIANAPOLIS has not only assurance of cheap fuel gas through its co-operative Consumers' Trust, but it has paved the way for cheaper light and broken the back bone of monopoly in the city. Such examples are infectious, and some such infection is much needed in this country where anti-consumers' trusts are so rapidly multiplying.

***

THE difficulties attending the construction and operation of the first oil pipe line, if fully written up at this time, would read to many of the later arrivals in oildom like a wild and woolly romance. This line was not built by a trust, but it was a big step in reducing the cost of refined to the consumer, as shown between the figures for 1861 and 1887.

***

THAT pipe line from Lima to Chicago is a large sign of the better times coming for the Northwestern Ohio producer, predicted in these columns two months ago. That other projected line from Cygnet to Toledo, backed by those energetic Cleveland refiners, Scofield, Shurmer & Teagle, will be, perhaps, still more conclusive as the best results are only to be obtained under healthy competition.

***

NATURAL gas has produced wonderful changes in various localities, but nowhere have they been so marked as in Pittsburg. For years the twin cities of Pittsburg and Allegheny were buried in the gloom of a lowering cloud of smoke, until the vapor from nature's laboratory was put to use and permitted the glad sunlight to enter and kiss the soot from their begrimed walls. There is nothing extravagant in Mr. McLaurin's apostrophe, reproduced in another column.

***

THE group of scouts presented to our readers this month is a thoroughly representative one, as among the eight are some of the best men that ever followed the business. We are sorry, however, that we are not able to include William Edwards, better known as "Billy," and B. S. Tupper, the only member of the "old Hoodoo gang" in the field at present. But it was not often that as many as eight of "the boys" were gathered together at any place, except under the sighing hemlocks or in the field boarding house, places where the camera and photographer are unknown.

***

PAYMENT of workmen thrown out of employment is a tower of strength in the shut-down and shut-in movement. Not only payment of the drillers and tool-dressers who could do mischief if let loose, but payment of all others. The producer, receiving as much for 65 per cent. of his production now as for 100 per cent. before the movement was started, is as able to pay his labor now as then. The Standard, realizing $200,000 a month on its investment in pipage and the profits of an advance from 60 to 95 cents on 1,000,000 barrels a month, could afford, as a matter of simple justice, to give at least $100,000 a month to the workers. These people did the work to pile up these stocks; they should have part of the fruits of their toil as the surplus is being consumed, if they cannot have all.

***

IN this issue of the AGE may be found an article on "The Art of Drilling," by George Koch, of East Sandy, Pa. Mr. Koch has done much to bring artesian well drilling to that state of perfection where it may be termed an art. Perhaps he has done more than any other one man to achieve this result. He holds patents on the club-bit, the skeleton bull-wheel and other improvements about oil and gas rigs and drilling tools, which have enabled the driller to reduce the time of sinking a well fully one-half. And for all this he has received nothing, unless it is grateful appreciation on the part of those who profit by his inventions, for he has never demanded a royalty on the manufacture of these devices. The oil country owes much to Mr. Koch, more than it can soon repay.

***

ON another page is the text of the original agreement under which the Standard Oil Trust was organized, as it was presented to the New York Senate committee. It has been widely commented that that committee did not ask hard questions of the Standard trustees and had no one present familiar with the business to suggest them. It has also been said that this Trust agreement is a very innocent document. The close observer, however, may detect clauses here and there not so innocent as they may appear. One of these is the provision that the stocks of the several Standard oil companies shall not be sold by either the trustees or the beneficiaries as long as the Trust endures. It seems singular that citizens of this country shall not be allowed to dispose of their property and that if they sell a Trust certificate or dividend voucher representing the value of that property, the purchaser shall neither be able to sell that property or control it. Again, in the list of the concerns whose stocks are held by the Trust are a number of Pennsylvania corporations, which, by the agreement, are practically blended into one to carry on the several businesses of mining, manufacturing and transporting contrary to the fundamental law of this State. While assuming the powers and functions granted by the charters of these several corporations, and appointing the officers and managers of the same contrary to the constitutional provision for their election, it is still seen that this Trust has no corporate or other legal existence under the laws of any State or foreign country. Neither has it an office in this State where transfers of stocks may be made, or papers served. All this may be innocent, but it looks more like a gigantic conspiracy to evade the laws of the States in which it operates.

Another Oil Burner.

The following in reference to the use of petroleum fuel by the Tannite company, of Stroudsburg, Pa., is of interest to those using steam boilers:

The oil used is crude petroleum from Lima, Ohio, and the fittings are of the simplest description and of comparatively slight cost. The oil is carried under ground from a reservoir over one hundred feet distant from the boiler house, a one-inch steam pipe having the capacity

to supply two boilers. A half-inch pipe conveys the oil to each boiler, and this pipe before reaching the boiler is connected with a steam pipe in such a manner that streams of steam and oil enter together into a small cast-iron retort in the center of the fire-box. In this retort, kept at a high heat, the steam and oil are converted into gas, and to all appearance gas is the fuel, and not liquid. The fire is easily managed, and there is great saving of labor due to entire absence of ashes. The company are not prepared at present to make any statement as to the practical results, but careful and repeated trials are being made, and it is thought in a few weeks exact data can be furnished.

THE ART OF DRILLING.

HOW IT HAS EVOLVED FROM A CRUDE MECHANICAL CONCEPTION.

BY GEORGE KOCH.

THE first oil well drilled was finished Aug. 28, 1859, at a depth of sixty-nine and one-half feet, and was known as the "Drake well." It was located near Titusville. It was commenced in June, and seventy-four days later it was finished. The drilling was done with rope tools, and when drilling they made about four feet a day, "Uncle Billy Smith" and his sons, of Tarentum, Allegheny connty, Pa., doing the work. The drilling tools were made at Kier's shop, Tarentum. It was a four-inch hole. At that time experienced drillers could only be had at Tarentum, where salt wells were being drilled, and at the same place, at Kier's shop, was the only place where rope drilling tools could be had. Drilling was done by hand; no engines were used.

At Tidioute the first engine was used in September, 1860, for drilling oil wells, but for some years after many wells were drilled by hand. A good, eight-horse portable engine and boiler cost about $2,000 during 1864 and 1865. The cost of getting them to the oil regions before the railroads were built was the cause of them not being used generally. The drilling tools used during the early days of the business were very primitive. The auger stem was from twelve to fifteen feet long, and one and a half to one and three-fourths inches in diameter. The sinker was ten to twelve feet in length. The tools, ready to drill, weighed from 225 to 350 pounds. The men on the well would, when necessary, often carry the string of tools on their shoulders for miles to a shop for repairs. They used one and a half to one and three-fourths-inch rope for drilling, and iron jars. George Smith, at Rouseville, made the first set of steel lined jars in 1866, for H. Leo Nelson. They did not prove a success. The steel came out of them. They were used with a set of three-inch tools, the largest drilling tools then made, but they did not prove successful.

The first well drilled through casing was located on Benninghoff run. It was drilled during the summer or 1868. This was the greatest invention ever conceived and applied to the art of drilling. Previous to that time all wells were drilled wet. No casing was used. Three to six months were required to drill a well 600 feet deep. Contractors at that time received from three to four dollars a foot for drilling, and the well owner paid all expenses excepting the labor. It would appear that at that time the contractor received a very remunerative price, but many of them failed. The trouble was fishing, and a lot of it was done. Iron jars and poor welding, especially the welding of the jars and the steel in the bits and reamers, was the trouble.

Fishing tools were very primitive. The valve sockets and the grabs were all the tools known for that purpose. When a bit, rimmer or part of the tools was lost in a well the floating sediment or drillings would settle and fasten it. The driller knew but little about fishing at that time, and the fishing tools were poorly adapted to the business. At this time, looking back over the tools used and the primitive methods then in vogue, it is indeed wonderful to think that up to 1868 5,201 wells were successfully drilled. In 1868 the first well was drilled through casing, and the time of drilling was made fully two-thirds shorter. The device was not patented. Tool fishing lost many of its terrors. Tools lost in a cased well do not become fastened by the drillings settling. When the oil sand is reached it can most always be told if it will be a paying well; in a wet hole but little can be told until it is pumped for a time. All drillers dislike to work in wet holes.

The rig now universally used is known as the "Pleasantville rig," and was first used by Nelson on the Meade lease, at Rouseville, in 1866. The writer took out a patent Nov. 11, 1873, on full size, fluted drills, which did away with the rimmer. This invention was a great benefit to the oil business. It reduced the time of drilling from sixty to twelve days, and the price from three dollars a foot to forty-five cents. The writer and his brother William filed an application March 31, 1877, for a patent on the bull-wheel now in use, and a patent was granted to them Oct. 1, 1878. This has also been of vast use to the oil man, but it has been poor property to the inventors. We hereby grant all our rights and privileges in and to both patents to the benefit of the oil men during the full term of both patents. During 1887 drilling was done without a sinker, and at this time no driller thinks of using them. This has been a great benefit to the trade. Heavier tools can be used with but little strain on the jars. The common sized tools are now forty-five feet long and three and three-fourths inches in diameter, with the jars screwed or welded on the top, and the rope socket screwed on to the jars. In formations, where but little sand is found, no jars are used. Drilling seems to be almost perfect at present.

Steel Piping for Natural Gas.

The pipe to be used in the piping of natural gas to the city of Chicago is described as follows: A mild steel disk of the required size is folded under heat by several applications of specially designed machinery into the structure of the steel, and made proof against rust, even muriatic acid producing no effect upon the metal. It is then drawn cold over mandrels, which has the effect of producing the form of a tube. It is then put on a mandrel and rolled to any desired length. It is next cleaned with acids and treated to a preparation of tin, inside and out, which permeates its thickness and increases its tensile strength twenty-five per cent. The result is very similar to that reached in steel wire.

An idea of the strength and temper of the metal so treated may be gained from the fact that receivers have been produced under this process whose thickness is 41-1000 of an inch, and whose bursting pressure is 600 pounds to the square inch. The comparative cheapness of the process is shown by the following figures:

A twelve-inch steel piping, whose bursting pressure is one thousand and one hundred pounds, can be sold at a handsome profit for $74.67 per hundred feet, while the cost of wrought iron and cast iron piping of much less bursting pressure is $211.25 and $150 respectively. Another interesting comparison is as follows: Twenty miles of twenty-four inch seamless steel piping one-eighth of an inch thick will weigh 3,000,000 pounds. The same piping, if it could be made of welded iron—as a matter of fact it cannot — would weigh 12,600,000 pounds. The same piping made of cast iron will weigh 26,755,000 pounds. In each case the bursting pressure of the steel is nearly twice that of the iron, and in addition a glass surface and a "positive" (non-leaking) piping is warranted. The piping will be made in all sizes, from 36 inches in diameter, and even larger if required, to the smallest used, and will probably be in lengths of 20 feet.—*The Safety Valve.*

The Canadian Oil Field.

The following account of the Canadian oil business is from the Petrolea *Topic* of March 2:

The shipments of crude and refined reduced to crude equivalent, over the lines of the Grand Trunk, and Michigan Central railways, for the month ending February 29, were:

Refined. Barrels.	Crude. Barrels.	Equivalent. Barrels.
GRAND TRUNK.		
7,182	11,703	29,658
MICHIGAN CENTRAL.		
4,576	1,032	11,440
Total crude equivalent		41,098

The shipments show a very considerable decrease as compared with those of the month of January which were 69,969 barrels. The advance of the season and the increasing length of the days may be accepted as largely responsible for this.

As compared with the shipments for February in 1887 there is a very marked falling off. The following shows the output in that month for the years mentioned:

1885. Barrels.	1886. Barrels.	1887. Barrels.	1888. Barrels.
41,869	37,617	50,858	41,098

Saxonburg's Condition.

On March 14 there were 8 drilling wells and 4 rigs up in the Saxonburg pool, Haymaker, Liggett & Co.'s No. 2 on the Crawford having been plugged and abandoned. This is the well which showed up so nicely when drilled into the sand in January, but which was burned by a gas explosion, the flows being unexpected and the boiler too near. They were fishing for the tools lost at that time for several weeks, but finally concluded the job was hopeless and have broken ground to move the rig.

The Saxonburg production for several weeks past is shown in the following table:

Date.	No. Wells.	Production.
March 10	47	1,006
March 3	48	1,130
Feb. 25	47	1,185
Feb. 18	45	1,140
Feb. 11	45	907
Feb. 4	44	1,117
Jan. 28	44	850

OIL TRANSPORTATION.

SOMETHING ABOUT THE METHODS OF EARLY DAYS AND IMPROVEMENTS DEVISED.

PERSONS familiar only with the oil industry during several years past can have no adequate idea of the primitive methods of twenty-five years ago. The great systems of pipe lines and the hundreds of storage tanks are now among the greatest wonders of those who visit the oil regions. Yet the first pipe line was laid in 1865, being completed and tested on the 10th of October of that year. This was a two-inch line from Pithole to Miller farm. The second pipe line was finished on the 16th of the same month, a six-inch pipe from the Island well to Pithole creek, and in connection with this line the construction of the first iron tank was begun on Oct. 15, to have a capacity of 15,000 barrels. This tank stood for years at the mouth of Pithole creek on the Allegheny river. About this same time the first oil tank car was built by George F. Kellar, of Pittsburg; so the month of October, 1864, was an important epoch in the history of oil transportation.

Prior to this time the festive teamster flourished and waxed wealthy, hauling oil to refinery, railroad station or waterway in barrels. The barrel-laden barge and the bulk boat were features of the navigable streams. In fact, the barges remained long after the pipe line came into general use, and the general adoption of boiler tank cars by the railroads was preceded by the general use of flat cars surmounted each by two wooden tanks with a capacity of thirty-five to forty barrels each, the writer having helped to manufacture these in Franklin as late as 1869, and it was about that time that the steamboats ceased altogether to ply the Allegheny between Oil City and Pittsburg with their tows of oil barges.

That first pipe line was a great trouble to its owners. The pipe was laid at a cost of about $50 a joint, and on the 32,000 feet of pipe they used three pumps. Late in September, just when the line was about completed, it was cut in several places to prevent its being used. Then some teamsters pulled it apart with a chain with several horses attached, and men had to be employed to guard it constantly. Incendiary placards were posted along its entire length and in all of the towns of the region inveighing against its operation. When it was finally in successful use it was burst in several places on Dec. 4 by reason of a man shutting the stop-cocks when he saw a tank overflowing, and it required three days to repair it. And then, about the middle of April, 1865, an attempt was made to burn the tanks at Miller farm. Guards were employed, armed with carbines, set to watch the property. But on the evening of April 18, a mob numbering about 200 men attacked and drove the guards from their post, burned the pipe line tanks, tore up a section of the pipe and burned other tanks belonging to Henry Harley & Co. and Bennehoff, who was afterward the victim of the famous Bennehoff robbery. In the skirmish that took place when the mob appeared the guards used their carbines freely, and several of the attacking party were borne off the field *hors du combat*, and it was surmised at the time that one had been killed. However that might have been, the injured men were secreted and no one outside of the members of the masked mob knew who they were.

The following reminiscences of the olden time make "mighty interestin' readin'" now. The first is from a correspondent of the Buffalo *Express* and the other is an interview in the Buffalo *Courier* with S. E. Van Syckle, of that city, who, with H. C. Ohlen, Henry Harley, Charles Hickox, Charles W. Noble and Reed & Cogswell, built the first pipe line. The *Express* correspondent writes from Titusville as follows:

Your correspondent, in the palmy days of Petroleum Centre's noontime of excitement, was a 12-year-old lad selling apples, oranges and papers on the narrow and muddy streets of that mushroom metropolis. Well can I remember the old, familiar cry with which "us boys" used to make the streets ring: "New York, Buffalo and Erie papers: *Express*, *Dispatch*, *Tribune*, *Herald*, *Times* and *World*!" Everything in those days in the shape of a newspaper sold for ten cents. Apples, if not very large, were three for ten cents and the more robust ones readily brought five cents each. It cost fifteen cents for a shine, and any "kid" departing from this rule was fired from the street and banished from future association with the two or three hundred grinning youngsters engaged in "de bizness." If trade got a trifle dull, the whole crowd would adjourn to the bank of Oil Creek, which celebrated stream ran, and still runs, directly through the centre of the town, and with axes, hammers and any other improvised tools we could lay our hands on, we would reap a rich harvest of quarters by tearing from the hoofs of dead horses bestrewing the creek's bank the iron shoes and selling them to the keepers of the blacksmith shops. It was no uncommon sight in those days to see scattered along the creeks's bank hundreds of dead horses, some of which had of course died from natural causes, but the great majority had met death while engaged in wrestling with the deep mud holes composing most of the roads, or were drowned while at their posts in front of an oil barge, which they were towing up the creek.

There were some terrible scenes enacted during the days previous to railroads and pipe lines on Oil Creek. Almost every producer in those days owned his own boats, or barges, as they were called. The boats were about fifty feet in length by fifteen or twenty feet in width, lined with tar and caulked with oakum. The oil was hauled in barrels from the wells and then "dumped" directly into these boats until they were nearly full. These boats were called "bulk boats."

After the boats, scattered along the creek for miles, had each received its cargo of "grease," word was sent to the "upper dam" to "pull the shoat." The "upper dam" mentioned was located on the creek not far below this city and had been erected in former years for the purpose of furnishing motive power for a large saw mill owned by the Oil Creek Lumber Company. As soon as the "shoat" was "pulled" the fun, excitement and danger commenced. The water rushing madly toward Oil City and the river, bearing hundreds of the bulk boats with their precious burdens of high-priced grease.

Oil was worth at that time from $7 to $10 per barrel. The great danger in shipping oil by the process described was the chance one took of being stayed in by getting into a "jam." These "jams" were terrible and were caused by the forward boat or boats in the mad race running foul of some unseen object in the channel and coming to a stop. When this occurred the boats following would mass together ten and twenty deep. Some of them would break and the released oil would go to swell the flood. The only thought of the occupants was to save themselves; groans, curses, prayers, sounds of breaking timbers, rush, tear smash, bang, the work of months gone in moments. Then came the vanishing of the waters as they hurried onward, and all that was left of the exciting scene of a few moments before was a high pile of twisted timbers and a mass of greasy wooden splinters.

These scenes were of frequent occurrence in the times I speak of. Oil that was not boated in those days was hauled to its destination in barrels loaded on wagons. To cross the main street of the town at certain times of the day was a practical impossibility. At early dawn the stream of teams would commence to move from the wells with their loads on their journey to the refineries and shipping points. Most of these points were from eight to twenty miles distant. Two dollars and a half and $3 per barrel and from that to $5 was the price paid for handling.

For three hours in the morning the procession of teams was uninterrupted. Splash, splash, splash; "Geet oup," "Yup there;" singing, swearing, whipping and splashing from one deep hole to another; now a horse goes down and is drowned in the seemingly bottomless mud; drag him away to the creek's bank and bring along another "noble animal to take his place. The noses of the horses touch the rear barrel of the load preceding them. No chance to cross the street until this greasy caravan has passed. If a teamster by any mishap loses his place in the line it throws him back from two to three hours, for he must then wait and take up his position at the tail end. Then again at night when the teams return with their "empties" the same scene is enacted. It was a fearful life in the land of petroleum for those who came here before the days of pipe lines and railroads.

At the time mentioned the nearest railroad was at Shaffer, about four miles up the creek. Dance halls, saloons, gambling dives, hotels, oil offices and the traditional oil region boarding house formed the principal business houses of the city (?) at that time, and the aim of all was "make what you can in any manner whatever and get out."

In those days flourished the celebrated "Jim" Linden, dance-house keeper and general tough; old Charley Topliff, the boss restauranter, well known to all, even to the present day; Gus Reil, gambler, confidence man and murderer. It was Reil who killed the Rouseville man in the Linden dance-house, and who afterward served ten years in Allegheny State prison. Ben Hogan was also a resident of "The Centre" at the time mentioned, and was proprietor of the "Fashion and Varieties," a dance-house and free-and-easy, located over a livery stable at the head of Washington street. Ben is now reformed.

It is a wonder that pipe lines were not earlier thought of. Tubing was used in wells then almost in the same manner it is now, and the fact that fluid would find its level when allowed its liberty was certainly as well known then as now. But despite all this knowledge, in the year 1864 an Albany company came to Petro-

leum Centre and built, at a great expense, a horse railroad up Benninghoff run for the purpose of carrying oil to the creek, a distance of about two miles, all the way down a sharp grade. The cars were flat ones and were drawn up by mules, and ran down by gravity, governed by brakes. The building of this road cost thousands of dollars, when a two-inch pipe, laid the same distance, would have done the work just the same at a cost of comparatively nothing. When the pipe line did come, wasn't there a time of it! and didn't the teamsters rear and tear and do almost everything but kill the promoters of the new device! As soon as the pipe line was talked of the teamsters declared war, and as arrangements were made to lay pipe the Jehus commenced laying plans for stopping the thing which they imagined would ruin them and their business for all time to come. They held meetings, organized themselves into bands, got out printed posters of a threatening character, burned engine houses and derricks, broke up engines and plugged wells. A reign of terror was inaugurated at that time by those crazy teamsters that can never be forgotten. But to no practical avail; the pipe line came and was shortly followed by the railroad, and from the time these two civilizers put in an appearance there was a cessation of the toughness of the place, and at the present writing, at Petroleum Centre, where once 10,000 busy people rushed and crowded after the dizzy dollar, there now reside but fifty people and they are each of a quiet turn of mind.

To a Buffalo *Courier* reporter Mr. Van Syckle said: "I was born in Hunterdon county, New Jersey, and during my early manhood I engaged in a number of business enterprises, ran grist mills, cooper shops, distilleries and linseed oil works, besides managing three farms. The panic of 1857 caught me with a lot of negotiable paper that I had endorsed, but by the dint of hard work I managed in time to pay off these obligations.

"I then, at the instance of several Eastern bankers and other friends who knew of my losses and had confidence in me, opened a grain commission house in New York, and in four months did a business of $400,000. But in the course of my dealings I learned that there was hardly a member of the Corn Exchange that had not failed at some time or another. This scared me, and at length I determined to quit the business, and I did so. After that for a time I was engaged in the manufacture of patent roofing material. In 1860 I started an oil refinery in Jersey City, and I was one of the first to make refined oil from the crude. The quality of the oil was the best and it was much sought after. Shortly after the Pennsylvania field was opened up in 1860, I sold my plant in Jersey City for $20,000—it had cost me $35,000—and went to the new oil country with the purpose of there building up a fortune. But I found that already there were crowds of men there; every claim was taken up, and there seemed to be no chance for a new comer to get a foothold. However, after looking around a while, I settled on a location near Titusville called Miller farm. In order to get control of the oil shipments I adopted this plan: I set out and scoured the country between Titusville and Buffalo, in the direction of Erie, and engaged ahead all the empty barrels I could find anywhere. Then I went through Warren county and did the same thing, engaging barrels for months ahead. It was a pretty risky thing to do, but I knew what I was about. Well, of course it was not long before the other shippers, having exhausted all their stock of barrels, began looking around after more. Well, sir, they couldn't get a dozen; I had them all. For a while I was flooded with oil. I shipped it just as fast as I could and engaged coopers around to make more barrels. During the next six months I believe I shipped fully 4,000 barrels a week, made a clear dollar on every barrel, and in six months I was $100,000 in pocket.

"In those days, you understand, the oil market jumped around like a cat. One day it would go up a dollar, and the next it might drop two The producers and traders in the oil country based their operations on the action of the New York market. When oil dropped in New York the shippers in the oil fields wouldn't touch a barrel. But just as soon as prices began to go up in New York they would ship. Well, I saw where some money could be made out of all this. I made large consignments. For instance, when oil was selling at a good figure I would sell so many thousand barrels, to be shipped along as wanted. Then, when the bottom dropped out of the prices, and nobody in the country would touch a barrel, I would buy in, and so contrived to secure a large margin of profit from the transaction. All this time, you know, every barrel had to be teamed from the wells to the railways, a distance of anywhere from five to twenty miles., and it was frightfully slow and costly work. At one time I employed a force of 100 teams. The teamsters were autocrats in their way, and they had their own way, too. On them depended all the hauling of the oil produced at the wells off the lines of railways. They knew this fact and the great value of their services, and charged accordingly. They charged for looking at the oil as it stood in barrels; they set a price on their faculty for estimating exactly how many barrels could be loaded into a wagon and what weight their teams would draw without breaking down. They charged an additional commission eu each mud hole that they struck on their journey, and if the wagon wheels went down to the hubs they would immediately double the price. They made more money than the well owners, and didn't care whether they hauled oil or not. I paid from $2 to $4 per barrel for teaming. The roads were little better than miry ditches, filled with deep ruts in which the horses floundered and the wagons became bogged. Every day the road was filled with teams, the drivers hallooing and cursing and urging their horses through the mud.

"All this caused me to reflect that there must be some other means of transportation provided, and I hit upon the pipe line theory as easy and perfectly practical. From the moment of the inception of the pipe line until it was completed and its usefulness demonstrated I became the subject of ridicule. There were thousands of men in the oil country then, and Titusville was thronged with people who could not find accommodations. At the Morey House in Pithole, when it came dinner time there were three or four men to eat from each plate on the table. I was pretty well known and liked among the oil men, and a side table was reserved for me and some of my friends. The waiters used to turn the chairs up so that no one should take our places before we came in. Well, these very friends of mine that sat at the table with me, when they heard me talking about this pipe line, really pitied me. They did all they could to discourage me. They told me it was folly to attempt such a thing; that it could not be done, and that the experiment would cost a mint of money. Well, I told them I expected it would cost a good deal, $100,000 perhaps, but that I had the money and was sure the plan was feasible. As for the crowd, I was simply made the butt of their ill-natured jokes. They would sarcastically inquire if I intended to put a girdle around the world, and how in the world I expected to make oil run up hill. This at length grew to be a form of persecution, and became so annoying that I had to take my meals at the hotel privately, unable any longer to endure the revilings and scoffiings that greeted me in the public dining-room, and in order to avoid the loungers in the front room of the hotel I used to go out and in by the back doors. Still I kept steadily at work, and early in the fall of 1865 I dug trenches and laid the pipe. The pipe was made to order at Reading of wrought iron, two inches in diameter. Two of these pipes were laid side by side in the two-foot trench and was carried a distance of five miles up hills and down dales from Miller farm to Pit Hole, with branch lines leading to Cherry Run, Bull Run and Pioneer. At length the system was completed, and I began pumping oil into the pipe. The experiment was perfectly successful from the time the first barrel of oil was pumped into the pipe, and I had the pleasure of seeing my detractors silenced for a little while. But my success by no means quelled the opposition to me. Instead of the calm which I thought would follow the completion of my work, I raised a tempest. It was the teamsters now with whom I had to contend. They saw the value of this means of transportation, and they also saw their profits vanishing from them, and they tried every conceivable way to worry and annoy me. They pried the pipes with pickaxes or fastened log chains around them, hitched their teams to the chains and pulled the pipe apart. To put a stop to this I sent to New York for some carbines and armed a patrol to watch the line. Not long after the line was laid two partners who had joined with me to work the thing failed for a considerable amount, and as they were involved to the amount of $15,000 at the bank I assumed the payment of the debt, and made an agreement with the creditors that they should take the line and run it until the debt was liquidated, which was done in the course of the next nine months. Not long afterward a tank line company was formed down East, and they came to me and wanted me to connect my pipe line with their system, in payment for which I should receive a certain amount of stock in the company. I agreed to this. They began to operate the pipe line and gave me a memorandum stating the amount of stock I was entitled to. It was not long before the company became insolvent, the line passed into other hands, and I had nothing but the memorandum which was of no earthly value. I might have sued for my property, but the construction of the line had taken all of my money. So there I was, left out in the cold, while the pipe line that I had originated and built passed into the possession of others who became rich from it. And the pipe line system has now grown from

a small one of only five miles in length to a network of lines all over the country running out from the oil-producing regions in all directions and extending to the coast. Through them thousands of barrels of oil are forced daily by mighty engines. Pumping stations have been established along the lines for the convenience of producers. and the facilities for its transportation have kept pace with the enormous production.

To Refine California Oil.

The following account of efforts being made to get a good illuminant from California oil is from the *Golden State:* The Mission Transfer company believing it within the range of possibility to make a good illuminating oil, has recently gone to large expense in fitting up a refinery in Santa Paula, and has just made a test under the direction of their Superintendent, F. H. Dunham. We are happy to state that this test is of the most satisfactory character resulting in the best quality of illuminating oil. The oil is as clear and limpid as pure spring water and burns with a steady and clear flame. We have seen it tested in an ordinary lamp and in a student lamp with the best results. In the latter the flame was turned up until it ascended several inches above the top of the chimney without perceptibly smoking the glass, or throwing off an offensive ordor. Mr. Dunham, who is an experienced refiner claims that it is superior to any of the eastern refined oils, which claim we are inclined to corroborate.

The tests that have been heretofore made of Ventura and Los Angeles county oils have not been satisfactory. The difficulty seems to have been in the fact that the refiners were not experienced, and possibly the machinery used was not the best. All this and other obstacles have now been overcome and the Rubicon is now fully crossed. We have been looking forward to this with much interest, for its success promises untold wealth to this section of the country. Of course the company is now encouraged to enlarge its works to any capacity required.

The Eureka District.

A correspondent under date of March 1 sends the following detailed list of prodncing wells and operations in the Eureka, W. Va., district:

Farm.	*Owner.*	*Production.*
Rus Hammett,	Barnsdall & Co (burnt well)	30
"	" " No. 2.....	20
Cochran,	Barnsdall & Brown, No. 2.....	10
"	" " No. 3.....	8
"	" " No. 4.....	10
Hammett Bros.,	Barnsdall & Mills, No. 1..	3
"	" " " No. 2...	5
Producing wells.....		7
Production.....		86

Barnsdall & Mills are drilling No. 3 on the Hammett Bros.' farm and are due to get the sand about the last of next week.

Frank W. Brown & Co. are drilling on the Cording farm in Ohio, about 1½ miles northeast from the burnt well, and a little more than three-fourths of a mile north of the Ohio river. The well is now about 1,350 feet deep and sand is expected at about 1,600 feet. This well is located near a group of old-time shallow producers of 2 to 3 barrels calibre, about 18 miles from Macksburg, on a line running south about 15 degrees west.

The Gilman well, half a mile southwest of the Cording, showed for a 2 to 3 barrel well in the Eureka sand, but is drilling deeper. It is west of a line from the burnt well to the Cording, which latter is located on a carefully surveyed projection of the line of best wells at Eureka and is, therefore, a good test of the supposed extension on the north side of the river. The line is run between Barnsdall & Brown's No. 1 duster on the Cochran farm at the south rn limits of the village of Eureka and the Gilman venture, a southwest projection of the same line passing to the east of the duster at the west line of the Hammett Bros.' farm.

All of the producing wells have been shot with 40 to 60 quarts except the old burnt well, which is producing natural. It is now 4 months since this well was drilled through the sand, having produced from above the sand a long time previously.

NEW FUEL GAS.

THE RIVAL OF NATURAL GAS, THE PEERLESS, HAS FINALLY APPEARED.

SINCE the general introduction of natural gas as fuel in Western Pennsylvania, in Ohio and Indiana it has been generally admitted that fuel gas must become the staple heat supplier of the country. Numerous projects for the manufacture of fuel gas have been entered upon, but with indifferent success. It would appear, however, that George Westinghouse, Jr., the natural gas king and air brake inventor, of Pittsburg, has achieved success. Following is an account of his fuel gas process from the *American Manufacturer:*

Natural gas has a rival at last, and it is the result of deep thought and study on the part of brainy Pittsburgers, with George Westinghouse at their head.

Though there are about 500 patents covering processes for making fuel gas, none of them have been successful when conducted on a commercial scale. About eighteen months ago Mr. George Westinghouse, Jr., commenced to fully investigate the problem, after associating with himself the best gas experts and engineers. The result desired was to make a maximum amount of fuel gas having a high heating power from one ton of any class of coal, with a minimum loss of the total heat units originally contained in the coal. The practical objections to the patented processes heretofore have been that they required a special character of coal; too great a proportion was consumed for the small quantity of gas manufactured; they were too dangerous on account of having no odor, or too expensive to pipe on account of containing too large a proportion of incombustible gases.

Accordingly, Mr. Westinghouse organized the Fuel Gas and Electric Engineering Company, Limited, and last May the erection of a plant was begun on the South Side, in the rear of Atterbury's glass works. This was completed three months ago, and the results have even more than justified the expectations of the projectors. The plant is capable of producing over 1,000,000 cubic feet of gas per day. Various coals from different sections of the United States are now being tested in order to ascertain their actual value for the manufacture of fuel gas by this new process, as it is proposed to utilize the local, and therefore the cheapest coal per ton in any locality in which the process may be installed.

Briefly, the process consists in first driving out of the coal the coal gas, which is generally known as illuminating gas; part of the coke, which is a product of this part of the process, is then used, either alone or with raw coal, to produce generator gas, which is much of the same character as ordinary producer gas, but of a much higher efficiency. The remaining part of the coke from the first part of the process is used in the generation of hydrogen and several other constituents of ordinary water gas. The gaseous products which result from these different parts of the process are then mixed, forming the ultimate product of the process in its entirety.

The mechanical appliances which are employed, although new and elaborate in design, are so simple in operation that a plant necessary to manufacture 1,000,000 cubic feet of gas in twenty-four hours only requires the labor of three men and two boys during each shift of twelve hours. The amount of gas which can be manufactured from one ton of coal by this process depends upon the kind of gas that is wanted. Of the gas which is best adapted for metallurgical purposes about 150,000 cubic feet can be produced from one ton of coal, having over 17,000,- heat units; of the gas best adapted for domestic consumption, about 60,000 cubic feet can be manufactured from one ton of coal. In either case the amount of heat which is obtained, as far as the actual calorific work is concerned, is about the same, although differences in the character of the gas renders them more or less desirable for special uses to which they are put.

It is not generally understood why it is more economical to first manufacture coal into gas and burn the gas rather than to burn the coal directly. The reason is that when coal is burned directly for general purposes not more than from 15 to 20 per cent. of the actual heat contained in the coal is practically utilized.

While the work of developing and perfecting this new process has been going on every engineering question relating to the conveyance and distribution of fuel gas has received careful attention, and has been practically worked out. The low cost at which it can be manufactured makes it a substantial rival of natural gas.

Since the works were put in operation between 1,100 and 1,200 tons of coal have been used in experimenting. The beauty of the process is that it takes out every particle of gas there is in the coal. It has not as high a heating power as natural gas, but a far better combustion, being almost perfect in this respect. This superiority is evident when it is known that natural gas requires sixteen parts of air, and the fuel gas but eight parts. Any quality of coal can be used, but thus far only bituminous has been experimented with. Run-of-mine and slack has been largely utilized, the results being most satisfactory. With coal at $1.25 per ton and 60,000 feet of gas produced from that ton, it can readily be seen how cheap a fuel it is. At present the South Side plant is experimenting with Indiana and Illinois coal. The coal is shoveled into the producer where the gas is generated. From there it runs through a twelve-inch pipe into the scrubber and condenser, thence into the station metre, where it is measured, and from there into the holder which has a capacity of 55,000 cubic feet.

It cost nearly $100,000 to fit out the plant and develop the process here. Messrs. George Westinghouse, George W. Goetz and S. T. Wellman have been actively engaged in perfecting the inventions, and Mr. Goetz is now in Europe investigating the utilization of the gas for

making fine china and various other purposes. In their laboratory the company exhibit several styles of stoves in which the gas is burned. They will afford inventors every opportunity of displaying stoves and burners, as they are desirous of securing a cheap and at the same time durable article, by which the poorest man may be able to utilize the fuel. One style of stove they have can be made for $4.50 complete, and sold for very little more than that figure. Mr. Westinghouse himself has invented several kinds. The styles on exhibition show a beautiful flame, and the grate fire throws out as much heat as natural gas. It is made just as perfectly as the illuminating article and analyzed every hour, so the man in charge knows just what it is doing. The analysis during an inspection on Feb. 16 last showed the following:

	First sample. Per cent.	*Second sample. Per cent.*
Carbonic acid gas	4.60	3.00
Oxygen gas	....	....
Olefiant gas	.60	.80
Carbonic oxide gas	26.20	28.60
Hydrogen gas	46.00	42.00
Marsh gas	7.40	6.80
Combustible gases	80.20	78.20

The company has established a large factory at the corner of Liberty and Twenty-fifth streets for the manufacture of gas pressure and temperature regulators, and all other machinery and appliances necessary to the fitting out of fuel gas plants. Fifty men are employed at this factory. Over 100 applications have already been received by the company for estimates on plants, and the figuring is now being done. It is expected very soon to put a plant in a town of 6,000 inhabitants, for which negotiations have about been concluded, and plans and specifications are being made. The applications for estimates include glass works, pipe works, isolated manufactories, towns and cities. A plant with a capacity of 1,000,000 cubic feet per day will cost less than one-fifth as much as one with a similar capacity for making illuminating gas. The South Side Works are run night and day with but four men employed in actual gas making in each shift.

The South Side works consist of a main building of iron, seventy-two feet long, fifty-six feet wide and thirty-five feet high, which contain retort furnaces, hydraulic main, hydrogen producer, scrubbers and condensers, a return tubular boiler, the setting of which is specially adapted for the combustion of gas alone or of coal alone, thus providing facilities for making complete evaporation tests with both coal and fuel gas, in order to determine their relative efficiencies, also other necessary machinery. The engine and boiler rooms adjoin, and just off the latter is the metre room. Adjoining the meter room is the holder sixty feet in diameter and twenty feet high. Its capacity of 55,000 cubic feet is less than one-twentieth of the amount of gas which can be made by the works per diem, its principal use being to control and regulate the pressure between the producers and the outlet pipes in the works. About 100 feet from the producer building are located the laboratory and test rooms. The practical tests of various designs of stoves as mentioned above are very interesting. Temperature records are made, both inside and outside of the test room, in order to determine the actual heating capacity of different stoves under varying conditions.

STANDARD OIL TRUST.

ITS AGREEMENT AND COMPONENT PARTS MADE A MATTER OF RECORD.

THE committee delegated by the New York Senate to investigate the Trusts and their relations to the business interests of the State, called a number of officials and promoters of various Trust combinations to give testimony regarding the workings of these rapidly multiplying business "arrangements." While the investigation was conducted rather tamely and without the presence of persons not connected with the Trusts to ask pertinent questions, there was still much matter of interest elicited regarding these new fashioned pools. The Standard Oil Trust was represented by John D. Rockafeller and John D. Archbold, the former furnishing the greater part of the information. Among the papers submitted to the committee at its request was a copy of the Trust agreement and the list of companies controlled by it, which are given below:

Following is a copy of the agreement submitted by the Standard to the committee, being the conditions upon which about fifty oil refineries entered into the Standard Oil trust:

This agreement, made and entered upon the 2d day of January, A. D. 1882, by and between all persons who shall now or may hereafter execute the same as parties thereto, witnesseth. It is intended that the parties in this agreement shall embrace three classes, to-wit:

First—all the stockholders and members of the following corporations and limited partnerships, to-wit: Acme Oil company, New York; Acme Oil company, Pennsylvania; Atlantic Refining company, of Philadelphia; Bush & Co., Limited; Camden Consolidated Oil company; Elizabethport Acid works; Imperial Refining company, Limited; Charles Pratt & Co.; Payne, Abbott & Co., Limited; Standard Oil company, Ohio; Standard Oil company, Pittsburg; Smith's Ferry Oil Transportation company; Solar Oil company, Limited; Zone & Fleming Manufacturing company, Limited; also all the stockholders and members of such other corporations and limited partnerships as may hereafter join in this agreement at the request of the trustees provided for herein.

Second—The following, to wit: W. C. Andrews, John Huntington, John D. Archbold, H. A. Hutchins, A. J. Poucher, John D. Rockafeller, Lide K. Arthur, Charles F. G. Heye, William Rockafeller, J. A. Bostwick, O. B. Jennings, Henry H. Rogers, Benjamin Brewster, Charles Lockhart, W. P. Thompson, J. Bushnell, A. M. McGregor, J. J. Vandergrift, Thomas C. Bushnell, William H. Macy, William T. Wardwell, J. N. Camden, William H. Macy, jr., H. G. Warden, Henry L. Davis, estate of Jacob Marcy, jr., Joseph L. Warden, H. M. Flagler, William Macy, jr., executor; Warden, Frew & Co., Mrs. H. M. Flagler, O. H. Payne, Louis C. Whesten, H. M. Hanna, George W. Chapin, O. H. Payne, trustee; Julia H. York, D. M. Harkness, Charles Pratt, George H. Vilas, D. M. Harkness, trustee; Horace A. Pratt, M. R. Keith, George F. Chester, trustee; S. V. Harkness, C. M. Butt, and G. F. Chester, trustees; a portion of the stockholders and members of the following corporations and limited partnerships, to wit: American Lubricating Oil company, Inland Oil company, Baltimore United Oil company, Keystone Refining company, Beson Oil company, Maverick Oil company, Bush & Denslow manufacturing company, National Transit company, Central Refining company, of Pittsburg; Portland Kerosene Oil company, Chesebrough manufacturing company, Producers' Consolidated Land and Petroleum company, Chess, Carley & Co., Signal Oil works, Consolidated Tank-line company, Thompson & Bedford, Devoe manufacturing company, Vacuum Oil company, H. C. Vantine & Co., Waters, Pierce & Co., Eclipse Lubricating company, Franklin Pipe company, Salina Oil works, Salina Farm Oil company, Germania Mining company; also stockholders and members of other corporations and limited partnerships who may hereafter join in this agreement at the request of the trustees herein provided for. The parties hereto agree to form corporations under the laws of Ohio, New York, Pennsylvania and New Jersey. The purposes and powers of said corporation shall be to mine for, produce, manufacture, refine and deal in petroleum and all its products, and all the materials used in such business, and transact other business collateral thereto. Such other purposes and powers shall be embraced in the several charters as shall seem expedient. These powers may be restricted. Whenever deemed advisable by the trustees similar corporations may be formed in other States and Territories. Each corporation shall be known as the Standard Oil Company of such a State or Territory. The capital stock of each corporation shall be fixed at such an amount as may seem necessary to its organizers. The shares of stock of each corporation shall be issued only for money, property or assets equal to the par value of the stock delivered therefor. All of the property, assets and business of each corporation mentioned shall be transferred and vested in the said several Standard oil companies, and correct schedules of such property, assets and business shall accompany each transfer. Whenever the stocks of any corporation are vested in said trustees, proper steps may be taken to have all the money and property assigned and conveyed to the Standard Oil Company of the proper State, in which event the trustees shall receive stocks of the Standard Oil Company of equal amount.

The consideration for any stocks delivered to said trustees shall be the delivery of trust certificates equal at par value to the par value of the stocks of the said several Standard oil companies and equal to the appraised value of the stocks of other companies or partnerships delivered to said trustees. The appraised value shall be determined by the parties in interest and said trustees. The said trustees may, with any trust funds in their hands, in addition the mode already provided, purchase the bonds and stocks of other companies engaged in similar business, and hold the same for the benefit of the owners of said trust certificates, and may sell, assign, transfer and pledge such bonds and stocks whenever they may deem it advantageous to said trust so to do.

The number of trustees shall be nine. J. D. Rockafeller, O. H. Payne, William Rockafeller, are appointed trustees to hold office until the first Wednesday of April, 1885; J. A. Bostwick, H. M. Flagler and W. G. Warden until April, 1884; Charles Pratt, Benjamin Brewster and John D. Archbold until April, 1883.

Elections for trustees shall be held annually for terms of three years, except when a vacancy occurs. Trustees shall be elected by ballot by owners of trust certificates which have stood in their names thirty days prior to the election. The majority of shares represented shall elect. Special meetings may be called by a majority of the trustees on a call of ten per cent. of the certified holders. By-laws may be made, amended and repealed at any meeting by a majority of the trust certificate holders, provided that the essential interests and purposes of this agreement be not thereby changed.

The par value of the certificates shall be $100, and shall be known as the Standard Oil trust certificates. No certificates shall be issued for stocks and bonds held in trust. The trust certificates so issued shall be evidence of the interest held by the several parties in this trust. The stocks of the various Standard Oil companies held by trustees shall not be sold, assigned, or transferred by said trustees or by the beneficiaries or both combined so long as this trust endures. The stocks and bonds of other corporations held by said trustees may by them be exchanged or sold and the proceeds distributed *pro rata* to the holders of trust certificates, or said proceeds may be held and invested by said trustees for the purposes and uses of the trust. It shall be the duty of the trustees to receive all dividends and distribute all moneys and keep separate accounts of receipts from interest and dividends and of receipts from sales or transfers of trust property, and render the holders of trust certificates statements thereof. The majority of the trustees, whenever stocks or bonds have accumulated in their hands or their values increased, may increase the amount of trust certificates to the extent of such increase or accumulation, and divide the same among certificate holders.

Following is the list of the corporations, companies and partnerships, whose stocks are held wholly or in part by the Standard Oil Trust, together with the amount of their capital stock:

New York State—Acme Oil company, $300,000; Atlas Refining company, $200,000; American Wick Manufacturing company, $25,000; Bush & Denslow Manufacturing company, $300,000; Chesebrough Manufacturing company, $500,000; Central Refining company, $200,000; Devoe Manufacturing company, $300,000; Empire Refining company, $100,000; Pratt Manufacturing company, $500,000; Standard Oil company of New York, $500,000; Zone & Fleming Manufacturing company, $250,000; Thompson & Bedford company, $250,000; Vacuum Oil company, $25,000.

New Jersey—Eagle Oil company, $450,000; McKirgan Oil company, $350,000; Standard Oil company, of New Jersey, $3,000,000.

Pennsylvania—Acme Oil company, $300,000; Atlantic Refining company, $400 000; Eclipse Lubricating Oil company, $175,000; Galena Oil works, $150,000; Imperial Refining company, $300,000; Producers' Consolidated Land and Petroleum company, $1,000,000; National Transit company, $25,455,200; Standard Oil company, $400,000; Signal Oil works, $100,000.

Ohio—Standard Oil company, $35,000,000; Consolidated Tank Line company, $1,000,000; Inland Oil company, $50,000; Solar Refining company, $500,000.

Kentucky—Standard Oil company, $600,000.

Maryland—Baltimore United Oil company, $600,000.

West Virginia—Camden Consolidated Oil company, $200,000: West Virginia Oil company, $119,000.

Illinois—P. C. Hanford Oil company, $500,000.

Minnesota—Standard Oil company, $100,000.

Missouri—Waters-Pierce Oil company, $100,000; Maverick Oil company, $100,000.

Maine—Portland Kerosene Oil company, $200,000.

Iowa—Standard Oil company, $600,000; Continental Oil company, $300,000.

Oil Freight Discrimination Forbidden.

Following is the text of the opinion given by the Inter-State Commerce Commission in the case of George Rice, of Marietta, O., against the Louisville & Nashville and other railroads, charging discrimination in favor of the Standard oil company:

Complainant's method of shipment was in barrels. This was the only method for which any of the defendants supplied rolling stock to their patrons. The Louisville & Nashville and the Cincinnati, New Orleans and Texas Pacific companies had each a few tank cars, but the tanks upon them were owned by the Standard oil company, of Kentucky, and they were not obtainable by others. Parties desiring to ship oil in bulk by tank cars could only do so by procuring and tendering to the railroad companies the cars for transportation. The defendants by their rate sheets gave rates on oil in barrels, and to many towns, but not all, on oil in tanks also. Generally the rates on the transportation of oil in tanks were car rates, but in some cases they were by the hundred pounds. The rate sheets gave no information as to how tank cars were to be obtained.

The commission decides that it was the duty of the defendants to publish information on this subject with their rate sheets, and that they did not fully give the information regarding rates which the act to regulate commerce intends shall be placed before the public unless they did so.

It is obvious that instead of the defendants offering two methods of transportation, which are open to the acceptance of all, they offer only one which is so open. The other is offered on such terms that it can by possibility be accepted only by parties who can control a considerable capital, and who will supply for themselves an important part of the means of transportation and also supply terminal facilities. The man of small means who adopts the method of transportation in barrels cannot be said to do so of choice, when the failure of the carrier to supply for the other the customary means of exportation compels him to do so. It does not seem to us either just or plausible to say under such circumstances that the person whose oil is carried in barrels has voluntarily chosen that method and has no concern with the charges imposed on his competitor who adopted the other. He is, on the contrary, vitally concerned with those charges, and if his own are not to be gauged in some degree by them he may be ruined in his business without redress, even though the charges he pays, when considered by themselves may not seem unreasonable. The commission lays down the general rule that the tank is to be considered a part of the car itself, and for whatever is carried in it the charges ought to be the same by the 100 ponds as is made on the transportation of barrels of oil in carload lots in other cars. Even then the shipper in barrels is at some disadvantage, for he must pay freight on the casks as well as on the oil; but this, as between him and the carrier, is not unjust. This ruling does not preclude such allowance for the use of tank cars as is customary, provided it be reasonable. It assumes that such allowance will be made. But it should be made on some system by some rule of uniformity, and the authority to make must not, carelessly or otherwise, be made a means discrimination.

The case of each of the defendants was then considered separately, and in the case of the Louisville & Nashville railroad an order was entered that the defendants cease their unjust discrimination, that they cease to make tank rates when the tanks differ in capacity and that they conform their charges on tank, car and barrel shipments to the rule above prescribed.

In the case of the St. Louis, Iron Mountain & Southern railroad company, the Commission finds that the defendant made excessive rates on barrel shipments and that the effect was to unjustly discriminate against the complainant and to give undue and unreasonable preference to shippers by tank cars. Order was entered that its charges be corrected and made to conform to the rule.

In the other three cases, the Mobile & Ohio, the Missippi & Tennessee and the Illinois Central, no orders were entered. The Commission states that, while the questions raised by the charges are important, they scarcely received any attention, either in the taking of the evidence or in the arguments which were made on behalf of complainant. A decision upon them would affect other parties quite as much as it would the parties now before the Commission, and under such circumstances it would be improper to pass upon them now.

How They Began Trading.

In accordance with the recent announcement members of the Stock Exchange began trading in pipe line certificates on March 1. Arrangements had been made so that quotations were received from Pittsburg, Oil City and Bradford direct and the Consolidated Exchange's figure were not used. During the first hour after the opening 350,000 barrels of oil were traded in. The total sales for the day were 681,000 barrels. The dealings opened with a sale of 10,000 barrels at 93½, while at the Consolidated Exchange the opening sales were made at 94 The quotation in the Old Exchange immediately moved up, but on the Stock Exchange 10,000 more barrels were sold at 93⅞. This was followed by the sale of 20,000 at 93¾.

The three transactions were all that were made in the first fifteen minutes, being a total of 40,000 barrels, against 160,000 barrels traded in during the same time in the Consolidated Exchange. The crowd around the space alloted for trading in pipe line certificates was the largest on the floor of the Stock Exchange, and included all the prominent operators.

OPERATIONS IN FEBRUARY.

Wells Completed, Wells Drilling and Rigs Up and Building in the Entire Region.

THE list of operations presented this month is full and complete, covering the New York and Pennsylvania oil fields from Cuba to the West Virginia line, andtaking in the wildcat wells in out of the way places that sometimes elude the vigilance of the wary field reporter. Yet drawing comparison with the month before there was less work under way than then. Not much less, for a very smal list was presented Feb. 1. But decreased activity is clearly shown by the fact that 12 fewer wells were finished during February than during January, leaving still a smaller list. At the close of January there were more new rigs up or building than at the close of December, and these show up in the drilling list, swelling it beyond the drilling list of Feb. 1 Possibly this may lead to an increase in the number of completed wells in March as compared with the month under review, but the small rig list does not augur much employment for the non-union driller toward the close of the month.

The only points showing increase of operations are Reibold, Canonsburg and the Butler Eastern belt, the active section being known as the Gumper district, from a farm of that name. The new Reibold wells are located on the ragged edges of that pool and people familiar with the territory predict that half of these will be dry, at least. The other half have an even up chance to make a Schlegel & Lentz "scratch" or come in dusty. They are all offsprings of the lucky happening of the Schlegel well, which was too much of a temptation for weak-kneed ones who were secretly disposed to make hogs of themselves anyway. At Canonsburg the "boodle" politician has joined hands with John McKeown and the Pittsburg Manufacturers' Gas company in a merry go 'round to knock somebody out. Mr. Flinn and Mr. Magee both joined hands with the gang last winter to knock the producers out in the Senate of Pennsylvania, so nothing decent could well be expected of them now. But the uncertain characteristics of Canonsburg territory may recoil against them and leave them with a big privilege to drill on the Morganza farm and nothing to drill for. McKeown has already drilled two holes in that section for a 12 barrel production, which is not paying out very fast, even at present prices. The Gumper district is not a dangerous one, being good for only 5 to 30 barrel wells as the result of two months of tedious pounding with the club-bitt.

The development during February was featureless. The most exciting events of the period were the completion of the Wheeling Oil Co.'s well on the McBurney farm at Washington and the Golden, Wuller & McBride No. 3 on the Aderhold at Saxonburg. In the absence of real big wells the McBurney was magnified into a gusher and exercised a depressing effect on the market out of all proportion to its importance. The Golden No. 3 has settled down as a good producer and may lead to the opening of a south bound annex to Saxonburg, though it is not believed to be of great import to the trade. But the work of the month has been important in one respect at least. It has planted 25 marks of condemnation on territory that before promised to yield some oil. Only 56 wells finished and 25 of these dry! This is an unheard of proportion of failures and it tells an eloquent story of its own. It is the pitiful tale of men who would have profited by the sacrifices of others, but have, instead, buried their dollars in rocky tombs and drowned their hopes in salt water.

Following are the summaries of wells completed, showing the work of two months at a glance:

WELLS COMPLETED.

	February.			January.		
	Wells	*Prod.*	*Dry.*	*Wells*	*Prod.*	*Dry.*
Allegany	..	..	..	2	10	..
Bradford	1	8	..	3	9	1
Middle Field	3	18	2	13	56	5
Venango	19	77	6	26	138	5
Clarion	5	28	2	1	16	..
Butler and Armstrong	17	283	8	20	623	5
Washington	4	180	2	2	123	..
Shannopin, etc.	7	16	5	1	25	..
Total	56	610	25	68	1000	16
Total Jan.	68	1000	16			
Difference	12	390	9			

The following summaries compare the work under way:

RIGS AND WELLS DRILLING.

	Feb. 29, 1888.			Jan. 31, 1887.		
	New Rigs	*Wells Dr'g.*	*Total*	*New Rigs*	*Wells Dr'g.*	*Total*
Allegany	..	1	1	0	1	1
Bradford	..	2	2	0	2	2
Middle Field	1	7	8	7	5	12
Venango	10	17	27	8	17	25
Clarion	2	3	5	6	4	10
Butler & Arm	8	36	44	13	17	30
Washington	7	14	21	8	16	24
Shannopin, etc.	..	3	3	0	9	9
Total	28	83	111	42	71	113
Total Feb. 29.	42	71	113			
Difference	14	12	2			

These figures show 12 fewer wells finished in February than in January, and 9 more dry holes. The production of February's new wells is 390 barrels daily smaller than those of January. At the close of February 12 more wells were drilling than at the close of January, but this is neutralized by the presence of 14 fewer rigs, making a total decrease in the list of operations of 2.

ALLEGANY AND BRADFORD.

The Allegany field presented nothing in the way of completed work, and had a solitary drilling well. This is owned by Wilson Hellem, and is located along the road between Cuba and Rushford. It was already 2,300 feet deep, but still drilling for general results. The big Bradford field finisbed one well in February, a small producer. It carries over one drilling well from January better located for gas than oil, and it presented one new drilling well, the property of Isaac Willetts, located for a 5 to 10 barrel well.

THE MIDDLE FIELD.

The middle field division does not contain much of interest. An 18 barrel well was finished in the new Elk county district. The work under way is principally located in the same section, though a very few wells are scattered about Warren and Forest. J. C. Welsh, having abandoned Balltown, has taken to the woods. He has a well on warrant 5,697 near the banks of the Clarion river, that is shut down at a depth of about 1,900 feet and mystified. It is about at Speechly sand level and one of the best scouts in the region classes it as probably dry. It has been mystified from its inception to the present time. Another wildcat is also under way in the hemlock fastnesses of that section.

VENANGO.

The old pioneer county did not complete so many wells in February as the month before, but increased the number under way by 2, the increase appearing in the rig list. The operations of this division are mainly in light, but comparatively sure shallow territory. Innis, Davis & Lee are drilling on the Woods farm about 2 miles from that famous memory, Pithole. They have finished two dusters on the farm, but have courage and money enough for another.

CLARION.

Hardly a member of the "Old guard," those who cbased after greasy wealth prior to the Centennial year, but feels his heart warm a little at mention of old Clarion. It was a very pleasant county to operate in, though the territory was treacherous. One little well was finished out near the Cogley development in February. At Clarion borough Leeper & Co. have a fair producer adjacent to the Normal School well, on the east side, and Cadwallader, Lord & Henne have a very small producer to the west and south about the same distance. This firm has two dusters to the southwest as a further reminder that drilling against a shutdown does not always pay. There were still 4 wells drilling there and 2 rigs ready for business.

BUTLER AND ARMSTRONG.

This division of the field shows a decided increase in work under way, the only one that does. At Reibold, encouraged by the lucky hit of Schlegel & Lentz, a number of persons have become active, where there was practically nothing being done a month before. In the country between Reibold, Saxonburg and the Allegheny county line several wildcat ventures are under way, searching for a chance rich gusher pool that may be yet undiscovered there. Brush Creek shows no diminution in the amount of work going forward, though the reward there has been light for the energy displayed. The proportion stands as 8 to 2 in favor of the dry holes. The Chambers Oil company, otherwise Burchfield & Co., have a rig up northeast of their producer and timbers on the ground for another, though Mr. Burchfield says if his counsels prevail no more wells will be drilled before November. At Saxonburg there has been a decrease in active work. On the Eastern belt about the Gumper, Black and Morrow farms there is some unreasonable activity in drilling for small wells, and the scattered wildcat list has grown some, one of the most important of these being Thornburg & Wadwell, sometimes called S. E. Leech & Co., near Boydstown, on a projection of the Greece City belt. These parties have been labored with and show some signs of surrender to the P. P. A.

WASHINGTON.

Interest in the Washington field was somewhat revived in February. The Wheeling Oil company's well on the McBurney farm attracted attention to the old Washington field by making 20 barrels for one hour on opening the last pay streak in the "fifty-foot" sand. It fell off

quite rapidly, however, indicating drainage. At its best it was not a very large well, but was the largest finished in the entire region during the month. It was larger than expected, and lent interest to the Fergus venture located to the east and a little north, which was at the top of the sand on the last of the month. It has since been drilled in and reached a production of 125 to 150 barrels an hour. At this writing, March 15, it is doing 75 barrels an hour.

Canonsburg, too, attracted much attention. No wells were finished there during February, but John A. Snee & Co.'s wildcat on the McPherson farm, two and-a-half miles northeast of developments, has been finished since and is dry. Very little Gantz sand was found. The top of the "fifty-foot" sand was found 30 or 40 feet below where it was expected. Only shells and slate were found where the Gordon sand should have been. The formations were totally unlike those found in the producing wells to the southwest.

SHANNOPIN, GREENE COUNTY, ETC.

The Shannopin section produced 3 dry holes during February as its total of finished work, and began the new month with nothing under way. The three dusters fell to the lot of one firm and it is probably discouraged. Mt. Nebo brought another failure to the record for February. Greene county operations have little in them that is exciting. Johnson & Hamilton finished their well at Nineveh and have pulled the casing, giving it up as a rank failure. Hukill and others are still drilling about Mt. Morris, and Greensboro and two small wells were developed during the month as a result, leaving 3 still under way.

Below is the detailed list of wells finished during February and of the work under way at the close of the month:

WELLS COMPLETED.

Bradford Field.

Farm.	*Owner.*	*Production.*
Indian Creek,	Ramsey & Co	8

Wells completed 1
Production 8

Middle Field.

HARMONY TWP, FOREST COUNTY.

Dossin, Wolcott & Co No 1 ..... dry

ELK COUNTY.

Warrant 2,676, Wilcox Oil Co 18

KINZUA VILLAGE.

Swift, C J Swift ..... dry

Wells completed 3
Production 18
Dry 2

Venango.

A P Dale, Dale Bros 4
Cherrytree, Farmers Oil Co ..... dry
Springville, Krepps, J N Patterson ..... dry
Red Valley, J Campbell, Ritts & Vensel 1

SLAB FURNACE, HALL'S RUN, ETC.

Keystone, Guckert & Co No 1 8
Dr Carey, Dodd & Ritchey 3
Haskell, Judd & Geiser No 2 8
Raisen, C W Warner No 9 9
Phila & Bost, Gates & Doty No 3 10
Keystone, Woods, Duffield & Co 6
Rumbold, Heeter & Co 5
Sayres, Chas Wurster 7
Boyle, Dietrich & Co No 1 5

VICINITY EMLENTON.

Six Points, Grant, Gosser & Gamble ..... dry

VICINITY PLEASANTVILLE.

Noyse, Hass Noyse 1
Zahnizer, Zahnizer & Williams 10
Woods, Innis, Davis & Lee No 1 ..... dry
Woods, Innis, Davis & Lee No 2 ..... dry
Grandin, Benedict & Bugbee ..... dry

Wells completed 19
Production 77
Dry 6

Clarion.

Wittaken, Berlin & Co 4

CLARION BOROUGH.

G Arnold, Cadwallader, Lord & Henne No 1 4
" " " " No 2 ..... dry
Campbell, " " " ..... dry
F M Arnold, Leeper & Co No 1 20

Wells completed 5
Production 28
Dry 2

Butler and Armstrong.

W Goehring, W L Guckert & White 15
Gumper, Brady & Co 30
Downey, Steinbrook & Co 10
" McTammany 10
Logan, Shaffer Bros ..... dry
Leasureville, Coe, Rhodes & Co ..... dry

BRUSH CREEK.

Sam Marshall, Munhall & Co ..... dry
Reynolds, McKelvey & Co ..... dry

SAXONBURG.

Adler, Troutman Oil Co 30
Seibert, John A Snee & Co No 5 10
Aderhold, Golden, Wuller & McBride No 3 150
Muder, Loan, Baker & Co No 2 3
J H Lonitz, Bolard, Greenlee & Co No 4 25
Smalley, B B Campbell & Co ..... dry
Logan, Fishel & Co ..... dry
Gallagher, Burchfield & Co ..... dry
Mercer, Golden & Co ..... dry

Wells completed 17
Production 283
Dry 8

Washington.

McBurney, Wheeling Oil Co 110
Leyda, Vanceville, Willets & Son ..... dry

CANONSBURG.

W Pollock, Scott & Co ..... dry

TAYLORSTOWN.

Hilton, Ellsworth & Preston 70

Wells completed 4
Production 180
Dry 2

Shannopin.

Oakdale, A. F. Allen Brown & Co ..... dry
D P Collins, A F Allen Brown & Tomlinson ..... dry
Murdockville, " ..... dry
Mt Nebo, Gailey Bros & Dimick ..... dry

Wells completed 4
Dry 4

Greene County.

Hathaway, Danstown, E M Hukill No 1 10
Fordyce, E M Hukill & Co 6
Nineveh, Johnston & Hamilton ..... dry

Wells completed 3
Production 16
Dry 1

WELLS DRILLING, RIGS UP AND BUILDING MARCH 1, 1888.

Allegany Field.

Farm.	*Owner.*	*Condition.*
Alma lot 4,	Breckinridge & Co (shut-down)	1200
Clarksville lot 10,	Steele & Fields (old rig).	
Scio lot 46,	L G Norton (shut-down)	350
Cuba,	William Hallam	2300

Wells drilling 1

Total 1

Bradford Field.

Tip Top, I Willets 500
Foster Brook, E T Co, T Kerwin & Co (shut-down) ..... rig
Mount Jewett, Knox Bros & Andrews 800

Wells drilling 2

Total 2

Middle Field.

CLARENDON.

Lot 532, C A & D Cornen No 5 (shut down). 900
562, Goal Bros No 7 (old rig) .....

TIONA.

Lot 109, J W Sherman 600

CHERRY GROVE.

Lot 661, A J Carroll 150

HARMONY TOWNSHIP, FOREST COUNTY.

Joslin, Wood & Co No 3 (old rig) .....
Hays, McIntyre (old rig) .....

MISCELLANEOUS, ELK COUNTY, ETC.

Millstone, Wynkoop & Co 1800
3663, Elk Oil Co No 4 (shut down) 2300
1464, Barnsdall & Co 600
3212, Beam, Ralph & Co ..... drilling
3212, Shultz & Co ..... rig
2032, Boggs, Rosenberg & Co 500
—, Rollin Dow (old rig) .....
5508, (Forest) Shannon Syndicate (shut down) 1675
5697, Clarion river, James Welsh 1900

Rigs up and building 1
Wells drilling 7

Total 8

Venango.

Buxton, Buxton & Co 200
Bullion, W T Baum 300
Clintonville, Widow Osburn, Osburn Bros. 350
Bull Valley, J McNamee, Hazen, Harrison & Co 300

SLAB FURNACE, HALL'S RUN, ETC.

Grant, Kelley & Smullin ..... rig
Phila & Bost, Gates & Doty No 3 ..... rig
McCalmont, Koch Bros ..... drilling
Boyle, Deitrick & Co No 2 400
" No 3 ..... rig
Zeigler, Wolf & Shafer No 1 500
Zeigler, Wolf & Shafer No 2 ..... sand
Zeigler, Bauser & Rapp ..... sand
Rote, Heeter & Co ..... drilling
Sayers, Heeter & Co ..... drilling

RED VALLEY.

J Hetzler, H D Brown No 5 300
D Batten, A P Dale 350
Black hrs, " ..... rig

VICINITY EMLENTON.

Fox, Fox & Morgan (2 old rigs) .....
E Crawford, F W Crawford (old rig) .....

VICINITY PLEASANTVILLE.

Vose, M N Miles No 2 ..... drilling
Stewarts Run, K H B tract, Carnahan & Son ..... drilling
Blank, W P Black ..... rig
Hays, " ..... drilling
Prather, Innis, Davis & Lee ..... drilling
Pleasantville lot, R W Brown ..... rig
Field, Cornin, Walters & Benedict ..... rig
Chandler, J Y Siggins ..... rig
Lyle, Alex Lowry ..... rig
Shamburg, Jerome Heald ..... rig

Rigs up and building 10
Wells drilling 17

Total 27

Clarion.

Fillman, J R Fillman (fishing) 800

CLARION BOROUGH.

Greenland lot, Rider, Aiken & Co ..... drilling
Garvin, Ira C Fuller (old rig) .....
Watertank lot, Kifer, Fall & Co ..... drilling
Maffett, Campbell, Piper & Brown ..... rig bldg
P & W R R, Semple & Co ..... drilling

Rigs up and building 1
Wells drilling 4

Total 5

Butler and Armstrong.

Farm	*Owner*	*Depth.*
Dodd,	Buffalo Creek, Reep & Sutton	1350
William Bromfield,	Davis Bros	drilling
Robert Morrow,	Morrow	drilling
Glade Mills,	Cappeau & Co	drilling
Bromfield,	R Jennings	sand
T Nolan,	Turner & Co	rig bldg
Anderson,	Miller & Co	1250
Black,	Dulity Bros	1000
"	Hagerson Bros	1200
Mushrush,	Wise & Co	drilling
Reiber,	Clark & Co	1450
Burton,	Farmers' Oil Co	300
Thos Montgomery,	Calhoun & Co (old rig).	
Gumper,	Gumper	500
J Black,	Burns & Co	900
Middlesex twp,	Bracken & Co	drilling
Hildebrand,	Neff Bros	1100
Gold,	J M Guffey & Co	rig
Mahan,	Marshall Oil Co	900
Logan,	J J Leidecker	500
Freedly,	Philadelphia Company	rig
Thornburg (Boydstown)	Thornburg & Wardwell	250

REIBOLD.

Galebaugh, Connors, Fishel & Bredin..... 400
" eidecker Bros..... 250
" Guckert & Co..... 500
Boggs, Glatzau & Coast..... 400
Miller, Schlegel & Lentz..... ...rig bldg
Snow, Gantz & Co..... 350
Goehring, Guckert, White & Co..... rig

BRUSH CREEK.

Davis, Jennings, Roth & Co.....1100
Bonner, Murphy Bros..... rig bldg
Ulrich, Munhall & Co.....drilling
McCullagh, Chambers Oil Co..... rig
Pine Run, McGrew Bros.....1900
Near Jamison's Mills, McGrane & Co..drilling

SAXONBURG.

Smalley, Root Bros 200
Battenfelder, Extension Oil Co..abandoned rig
Crawford, Haymaker & Co No 1.....1400
" " " 2 fishing...sand
Aderhold, Golden, Wuller & McBride No 5.. 800
Helmbold, B B Campbell (old rig).....
J H Lonitz, Bolard, Greenlee & Co No 4....1100
H Lonitz, " " " No 2.... 700
WidowLonitz, " " " No 2 1000
Pfabe, Reiber & Co.....rig bldg
Englehart, Urquhart, Lavens & Co.....1400
Foercht, " " 900

Rigs up and building..... 8
Wells drilling..... 36

Total..... 44

Washington.

Farm.	*Owner.*	*Depth.*
Dr C W Townsend, D C Linn		rig
McKeesport, Stone & Co (shut-down)		1800
Bane, Ten-Mile Oil Co (shut-down)		1039
Cameron, Willets & Young (fishing abandoned)		
Miller, Marshall Oil Co		2950
Fergus, S Fergus, (crooked hole)		2380
Munce, I. Willets & Son No 2		1700
Gordon, P L & H Co No 8..		800
Watring, (Buffalo twp) Wheeling Oil Co		rig blg

CANNONSBURG.

A H Griffin, John McKeown No 2..... 800
" " No 3..... 300
Gladden. Cannonsburg Light & Heat Co... 200
McNamara, Fisher, Guffy & Co (old rig)..
Gilfillan, (Sodom) Philadelphia Co.....drilling
McPherson, John A Snee & Co.....1550
Morganza, Flinn, Booth & Magee No 1.....1050
" " No 2..... 600
" " No 3..... rig
" " No 4.rig bldg
Douglass, Mfrs Nat Gas Co ..... rig
McKown, " No 2..... rig
McLaughlin' " .....rig bldg

TAYLORSTOWN.

Hutchison, Washington Oil Co No 1 (shut down).....2455
J M McMannus, " " No 2 (shut-down).....2480
Neeley, Washington Oil Co No 1 (shut-down).....2558
Sam Wright, Washington Oil Co (shut d'n.)1600
Jas Hodgens, Washington Oil Co No 2 " 1365
" " " 3 " 1263
" " " 4 (old rig).....
Hilton, Ellsworth & Preston No 2 (fishing).1400
Martin, Kuntz & Co..... 150
Grimes, Marshall Oil Co.....1550
Crawford, Palmer & Co (shut down)..... 100
Allison, R H Thayer (old rig).....

Rigs up and building..... 7
Wells drilling..... 14

Total..... 21

Greene County.

Evans, Mt Morris, E M Hukill No 1 (old rig).
D L Donelly, Alexander & Co (fishing).....1400
" E M Hukill..... 700

GREENSBORO.

Jones, Rubbert & Williams, (old rig).....
" James Ohlson,.....1450

Drilling..... 3

Total..... 3

OPERATIONS FOR GAS.

Wells Completed February.

ALLEGANY FIELD.

Wirt, lot 1, Empire Gas Co..... ....gas

Middle Field.

Lot 251, Pennsylvania Gas Co.....gas
Wilcox, National Transit Co No 34.. .. ....gas

VENANGO.

Haight, (Pleasantville) W P Black.....dry
Speechly, Oil City Fuel Supply Co..... .gas

BUTLER.

Dindinger, Butler Plate Glass Co.....gas

WELLS DRILLING AND RIGS UP AND BUILDING MARCH 1.

Allegany Field.

Wirt, Lot 1, Empire Gas Co.....drilling
" 58, Cuba Gas Co..... .....drilling
Clarksville, Lot 2, National Transit Co (fishing)..... 400

Middle Field.

Wilcox, National Transit Co No 34.....drilling
Lot 343, McKean, Citizens Gas Co of Kane (fishing).....1200
Erickson, (Kane)James McDade.....drilling
Marienville, Kahle Bros.....1000
Warren, lot 251, Pennsylvania Gas Co, No 21.....drilling
Richardson, (Kinzua) T G Phillips.....drilling

Venango.

Pleasantville, Syndicate .... rig
Speechly, Oil City Fuel Supply.....drilling
" " ..... . rig

Northwestern Ohio Operations.

The report of operations in the North-Western Ohio oil fields is as follows:

WELLS COMPLETED.

Lima district..... 7
Findlay district.....10
North Baltimore district.....16

Total.....33
Completed in January.... ... .25

Increase..... 8
Completed in December. 22

MARCH 1.

	Rigs.	Wells drilling.	Total.
Lima District... ..	20	10	30
Findlay District	13	8	21
North Baltimere.....	20	19	39
Total....	53	37	90

FEBRUARY 1.

	Rigs.	Wells drilling.	Total.
Lima.....	23	4	27
Findlay..... ..	21	17	38
North Baltimore.....	10	8	18
Total	54	29	83
Total March 1.....	53	37	90
Difference	1	8	7
Total January 1.....	44	30	74

EXPORTS IN 1861.

A correspondent hands us the following statement of petroleum exports, showing from what a little acorn the present tall oak grew:

	Gallons.
To Africa.....	445
" Antwerp	5,671
" Argentine Republic.....	4,200
" Australia	168,365
" Brazil	5,881
" Bremen	32,112
" British Guinea.....	3,035
" British N. A. colonies	2,636
" West Indies	3,719
" Cette.....	80
" China.....	400
" Cisplatine Republic.....	200
" Cuba.....	150,703
" Genoa.....	62
" Gibraltar.....	276,977
" Glasgow.....	42,348
" Hamburg.....	964
" Hayti	73,716
" Havre.....	58
" Lisbon.....	187,254
" Liverpool.....	115,644
" London	1,600
" Marseilles.....	3,702
" Mexico.....	15,552
" Porto Rico	13,925
" Rotterdam	640
" Venezuela.....	610
" West Indies.....	1,770
Total.....	1,112,476

Equal to 34,707 barrels.

	Barrels.
In 1862 export shipments, principally refined had increased to.....	270,000
1864, crude.....	232,680
1864, refined	543,525

Pipe Line Summaries.

Following is a comparison of the figures of the National Transit and Tidewater pipe lines for January and February:

NATIONAL TRANSIT CO.

	Barrels.
Acceptances, etc., Jan. 31.....	18,465,036.33
" " Feb. 29.....	17,692,036.33
Decrease.....	773,000.00
Credit balances Jan. 31.....	6,693,151.21
" " Feb. 31.....	6,512,185.42
Decrease...	180,965.79
Total liabilities Jan. 31..... ..	25,158,187.54
" " Feb. 29.....	24,204,221.75
Decrease.....	953,965.79
Gross stocks Jan. 31.....	28,339,619.09
" " Feb. 29..	27,432,972.35
Decrease....	906,646.74
Sediment and surplus Jan. 31.....	3,181,431.55
" " Feb. 29.....	3,228,750.60
Increase.....	47,319.05
Receipts from all sources January..	1,043,155.84
" " " Feb.....	946,086.16
Decrease.....	97,069.68
Total deliveries January	2,032,068.82
" " February.....	1,895,200.03
Decrease.....	136,868.79
Runs from wells January.....	803,536.82
" " " February.....	896,260.69
Increase.....	92,723.87
Regular shipments January.....	1,981,581.23
" " February	1,847,301.07
Decrease	134,280.16

The total receipts of the Transit Company for February were made up as follows:

Runs from wells.....	896,260.69
Received from other lines..... .	49,825.47
Total.....	946,086.16

The deliveries for February were made up as follows:

Regular shipments.....	1,847,301.07
Delivered to others lines.....	47,898.96
Total.....	1,895,200.03

TIDEWATER PIPE CO.

Acceptances, etc., Jan. 31.....	634,000.00
" " Feb. 29.....	575,000.00
Decrease.....	59,000.00
Credit balances Jan. 31.....	635,683.26
" " Feb. 29.....	646,105.19
Increase.....	10,411.93
Total liabilities Jan. 31.....	1,269,083.26
" " Feb. 29..... ..	1,221,105.19
Decrease.....	47,978.07
Gross stocks Jan. 31.....	1,420,703.29
" " Feb. 29.....	1,375,917.57
Decrease.....	44,785.72
Sediment and surplus Jan. 31.....	151,020.03
" " Feb. 29.....	154,812.38
Increase....	3,792.35
Receipts from all sources January..	147,146.13
" " " February.	161,916.63
Increase.....	14,770.50
Total deliveries January..... ..	155,522.15
" " February.....	208,475.71
Increase.....	52,953.56
Runs from wells January.....	96,658.54
" " " February.....	114,017.67
Decrease.....	17,359.13

The above receipts for February were made up as follows:

Runs from wells....	114,017.67
Received from other lines.....	47,898.96
Total.....	161,916.63

LANDER, Wyoming, is agitating for the building of an oil refinery there to supply that section. The sprightly *Mountaineer* in advocating the project, thinks the cost of illuminating oils might be reduced from 60 and 70 cents, as at present, to 40 or 45 cents per gallon. The average man here in the producing regions may wonder what the profit is between crude at 3 cents a gallon and refined at 70 cents, and where all this profit goes to.

Stocks Abroad.

Reports of stocks in London and the seven principal Continental ports are summarized in the following statement:

Stocks Afloat and Ashore.	*Feb.* 25, 1888. *Barrels.*	*Jan.* 21, 1888. *Barrels.*
Seven Continental ports	521,111	634,536
London and English ports	110,653	198,946
Total stocks afloat and ashore	631,764	833,482
Decrease in stocks since January 21	201,618	

A detailed statistical table giving the stocks on hand, the stocks in vessels on the ocean, and the amount unloading from the vessels at the different ports is appended, which shows at a glance the condition of affairs abroad and the increase or decrease as compared with the corresponding period of 1886. The shipments represent the amount of oil going to the interior of Europe from the seaports:

STOCKS IN FOREIGN PORTS FEBRUARY 25, 1888.

Ports.	*Stocks February 25.*		*Stocks afloat February 25.*		*Loading February 25.*		*Grand total stocks afloat and loading.*		*Receipts from July 1.*		*Shipments from July 1.*	
	1887 *Barrels.*	1888 *Barrels.*	1887 *Barrels.*	1888 *Barrels.*	1887 *Barrels.*	1888 *Barrels.*	1887 *Barrels.*	1888 *Barrels.*	1886 *Barrels.*	1887 *Barrels.*	1886 *Barrels.*	1887 *Barrels.*
Bremen	98,488	79,998	48,766	43,311	12,000	.....	159,254	123,309	505,034	604,550	477,430	569,650
Hamburg	34,012	67,437	80,259	50,815	35,000	43,900	149,271	162,152	644,317	800,742	715,036	761,187
Antwerp	92,001	18,116	7,237	31,010	17,500	71,900	116,738	121,026	659,171	606,358	633,628	581,183
Rotterdam	24,292	20,870	.....	.....	44,700	7,000	68,992	27,870	390,144	380,800	414,424	375,146
Amsterdam	11,566	32,930	39,387	15,340	.....	.....	50,953	48,270	171,423	188,333	203,442	158,474
Stettin	10,640	15,402	5,054	9,000	12,700	7,000	28,394	31,402	280,135	268,853	269,956	275,975
Danzig	20,305	3,945	.....	3,137	.....	.....	20,305	7,082	54,945	41,741	54,777	55,620
Total	291,304	238,698	180,703	152,613	121,900	129,800	593,907	521,111	2,705,169	2,891,377	2,768,693	2,777,235
London	100,350	78,153	31,100	24,500	30,000	8,000	161,450	110,653	461,583	589,950	455,249	512,883

	1885	1886	1887	1888
Total stocks Continental ports	657,049	248,784	291,304	238,698
Total afloat " "	160,309	293,569	180,703	152,613
Total loading	94,800	140,300	121,900	129,800
Total	912,158	682,653	593,907	521,111
Afloat and loading for direct Continental ports	9,000	55,000	36,800	.....
" " " Baltic Sea, exclusive Stettin and Danzig	7,500	3,000	.....	.....
Total Afloat and loading for Continental ports	928,658	740,653	630,707	.....
" " " " " London	94,832	148,852	161,450	110,653
" " " " " English harbors, exclusive London	43,100	61,500	96,400	.....
Grand total	1,066,590	951,005	888,557	.....

OFFICIAL STATEMENT—EXPORTS OF PETROLEUM, FEBRUARY, 1888.

BY WM. F. SWITZLER, CHIEF OF THE BUREAU OF STATISTICS, WASHINGTON, D. C., MARCH 8, 1888.

Customs Districts.	*Mineral Crude.*		*Napthas.*		*Illuminating.*		*Lubricating and Paraffine Oils.*		*Residuum.*		*Total.*	
	Gallons.	*Dollars.*	*Gallons.*	*Dollars.*	*Gallons.*	*Dollars.*	*Gallons.*	*Dollars.*	*Gallons.*	*Dollars.*	*Gallons.*	*Dollars.*
Boston & Charlestown, Mass.	.....	.....	250	63	319,667	34,613	15,268	3,401	.....	.....	335,185	38,077
New York, N. Y.	4,061,065	344,115	626,261	49,637	25,435,849	2,131,936	2,054,228	371,439	328,440	19,116	32,505,843	2,916,243
Philadelphia, Pa.	2,775,566	195,718	36,412	2,458	3,412,308	322,615	234,069	14,890	.....	.....	6,458,355	535,631
Baltimore, Md.	.....	.....	.....	.....	360,635	28,537	.....	.....	.....	.....	360,635	28,537
Total Feb., 1888.	6,836,631	539,833	662,923	52,158	29,528,459	2,517,701	2,303,565	389,730	328,440	19,116	39,660,018	3,518,538
Total Feb., 1887.	3,463,281	216,112	471,996	40,212	23,778,566	1,848,004	1,620,919	268,878	550,998	29,976	29,885,760	2,400,182
Total 8 months ending Feb. 29, '88	64,381,898	4,338,931	8,791,742	726,645	299,968,766	22,942,345	15,042,396	2,522,143	934,836	48,333	389,119,638	30,578,397
Total 8 months ending Feb. 28, '87	55,690,201	3,554,178	12,214,470	1,070,244	306,688,447	23,842,769	10,398,739	1,931,897	1,537,276	76,974	386,529,127	30,476,062

CRUDE QUOTATIONS FOR FEBRUARY, 1888.

Day of Month and Week.	Bradford.				Oil City.				New York.				Pittsburg.			
	Opened.	*Highest.*	*Lowest.*	*Closed.*	*Opened.*	*Highest.*	*Lowest.*	*Closed.*	*Opened.*	*Highest.*	*Lowest.*	*Closed.*	*Opened.*	*Highest.*	*Lowest.*	*Closed.*
1—Wednesday	90⅞	91½	89⅝	89⅝	90⅞	91⅝	89⅝	89⅝	90¾	91⅝	89½	89¾	90¾	91½	89½	89⅝
2—Thursday	89¾	90⅝	89¼	89¾	89⅝	90⅝	89¼	89¾	90	90½	89¼	90	89⅞	90⅝	89⅛	89¾
3—Friday	89⅞	90⅝	89½	90⅜	89⅞	90½	89⅜	90¼	90	90½	89⅜	90½	89⅞	90½	89⅜	90½
4—Saturday	90⅝	90⅝	89½	89⅝	90⅝	90⅝	89⅜	89⅝	90½	90¾	90	90	90½	90⅝	89¼	89⅝
6—Monday	89¾	89¾	88⅛	89⅝	89¾	89⅞	87⅞	89⅜	89¾	89⅞	88¼	89¼	89½	89⅞	88⅛	89⅛
7—Tuesday	89¼	90⅜	89⅛	89⅞	89¼	90⅜	89¼	89⅞	89¼	90⅜	89¼	90	89⅛	90¼	89⅛	89⅞
8—Wednesday	89⅞	90½	89⅝	90	89⅞	90½	89⅝	90⅛	90	90⅜	89⅝	90⅛	89⅞	90½	89⅝	90
9—Thursday	90⅜	90½	89¼	89⅞	90½	90½	89¾	89⅞	90⅛	90½	89¾	89⅞	90⅜	90½	89⅞	89⅞
10—Friday	90⅛	90⅜	89¾	89⅞	90	90⅜	89⅞	89⅞	89⅞	90¼	89¾	90	90	90¼	89⅞	89⅞
11—Saturday	90⅛	90⅛	89¾	89⅞	90	90⅛	89¾	89⅞	90¼	90¼	89⅝	89¾	90⅛	90⅛	89⅝	89⅞
13—Monday	89⅞	89⅞	88½	88½	90	90	88½	88½	90	90	88½	88⅝	89¾	89¾	88½	88½
14—Tuesday	88½	88¾	86½	88⅝	87⅞	88¾	86¾	88⅝	88¼	88⅝	86⅞	88½	88¼	88¾	86½	88½
15—Wednesday	88¾	89	87⅞	88	88⅞	89	88⅛	88	88¾	88¾	87⅞	88⅛	88¾	88¾	87⅞	88
16—Thursday	88	88⅜	87⅝	87⅞	88	88½	87¾	87⅞	88	88½	87¾	88	88⅛	88½	87⅝	87⅞
17—Friday	88⅛	90	88⅛	89⅝	88¼	90⅛	88⅛	89¼	88	90	88	89¾	88⅛	90	88	89⅝
18—Saturday	88¾	90	88⅜	88½	89⅞	90	88½	88½	90	90	88⅞	89¼	89⅞	90	88½	88½
20—Monday	88⅝	88⅝	88	88⅝	88½	88¾	88	88½	88⅞	88⅞	88¼	88⅜	88¼	88½	87⅞	88½
21—Tuesday	88¾	89¼	87¼	87¾	88¾	89⅛	87⅛	87⅞	88¾	89⅛	87⅛	87⅞	88⅝	89	86¾	87⅞
22—Wednesday	Holiday.															
23—Thursday	88¼	89⅜	87⅜	89¼	88	89½	87½	89¼	88	89⅜	87½	89⅜	87⅞	89¾	87⅜	89⅜
24—Friday	89¾	91⅛	88¾	89	89½	91¼	88¾	89¼	89⅝	91¼	88¾	89⅛	89½	91⅛	88¾	89⅛
25—Saturday	89½	91⅞	89⅛	91¼	89¾	91⅞	89¾	91½	89¾	91⅝	89⅝	91⅜	89⅛	92	89⅛	91⅜
27—Monday	92⅜	94⅛	91⅜	93⅝	92⅜	94¼	91½	93¾	92	94	91⅜	93⅜	92	94⅛	91⅜	93⅝
28—Tuesday	93¼	93⅝	92	92⅝	93	93⅝	92	92⅝	92⅞	93⅝	92	92½	93¼	93¾	92⅛	92½
29—Wednesday	92⅝	93⅞	92⅜	93½	92⅝	94	92½	93½	92½	93⅞	92⅜	93⅝	92⅜	94¾	92⅜	93⅝

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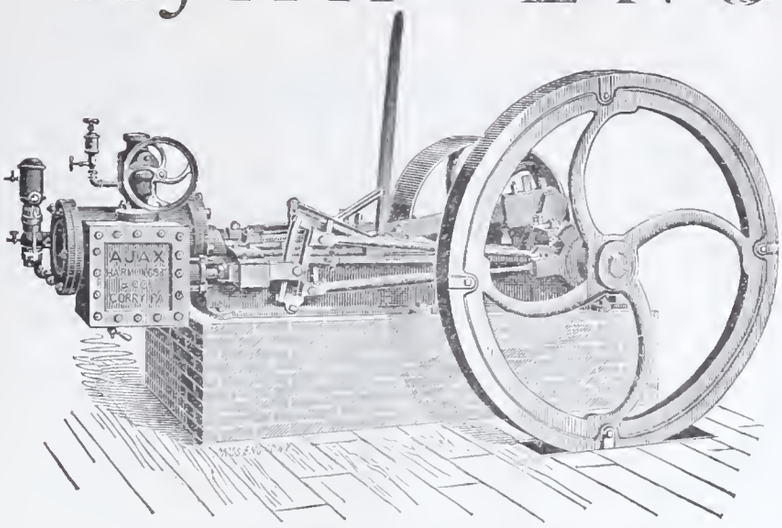

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PITTSBURG & WESTERN RAILROAD.

In effect Oct. 24, 1887. Central time. One hour slower than Eastern time.

NORTHERN DIVISION.

SOUTHBOUND TRAINS.

STATIONS.	No. 7.	No. 23.	No. 25.	No. 17.	No. 19.
	A M	A M	A M	A M	P M
Bradford Lv	.....	.....	.....	7 30	.....
Mt. Jewett	.....	.....	.....	9 15	.....
Kane	.....	.....	.....	10 10	.....
Sheffield Junc	.....	.....	.....	11 04	.....
				P M	
Marienville	.....	.....	.....	12 12	.....
Tylersburg	.....	.....	.....	12 55	.....
Clarion Junction	.....	.....	6 20	1 45	4 00
Clarion	.....	.....	5 50	12 35	3 30
Shippenville	.....	.....	6 30	1 58	4 14
Knox	.....	.....	6 45	2 14	4 33
St. Petersburg	.....	.....	7 24	3 04	5 20
Foxburg	.....	5 40	7 38	3 25	5 40
Parker	.....	5 50	7 48	3 36	.....
Bruin	.....	6 08	8 06	3 59	.....
Petrolia	.....	6 18	8 17	4 10	—
Karns	.....	6 22	8 22	4 17	9
Millerstown	.....	6 36	8 36	4 32	
St. Joe	.....	6 50	8 50	4 45	P M
Butler	5 15	7 18	9 30	5 20	1 50
Renfrew	5 28	7 39	9 46	5 38	2 13
Callery Junction	5 50	8 05	10 10	6 00	2 35
Allegheny....Ar	7 10	9 33	11 25	7 23	4 00

NORTHBOUND TRAINS.

STATIONS.	No. 34.	No. 8.	No. 18.	No. 24.	No. 26.
	P M	A M	A M	P M	P M
Allegheny ... Lv	5 40	9 20	7 20	1 40	4 40
Callery Junction	7 30	10 50	8 40	3 00	6 10
Renfrew	8 02	11 12	9 00	3 21	6 33
Butler	8 30	11 30	9 21	3 50	7 05
St. Joe	.....	.....	9 50	4 15	7 38
Millerstown	.....	.....	10 06	4 32	7 53
Karns	.....	—	10 20	4 45	8 06
Petrolia	.....	20	10 24	4 50	8 10
Bruin	.....	.....	10 35	5 00	8 22
Parker	.....	A M	10 52	5 18	8 39
Foxburg	.....	6 27	11 25	5 45	8 50
St. Petersburg	.....	6 44	11 41	6 00	.....
			P M		
Knox	.....	7 49	12 32	6 45	.....
Shippenville	.....	8 11	12 53	7 02	.....
Clarion Junction	.....	8 30	1 14	7 15	.....
Clarion	.....	9 00	2 15	7 45	.....
Tylersburg	.....	.....	1 48	.....	.....
Marienville	.....	.....	2 26	.....	.....
Sheffield Junc	.....	.....	3 06	.....	.....
Kane.....Ar	.....	.....	3 58	.....	.....
Mt. Jewett	.....	.....	4 40	.....	.....
Bradford	.....	.....	6 35	.....	.....

No. 4 leaves Allegheny at 6 a m; Callery Junction, 7:30; Renfrew, 7:15; arrives at Butler 8:10 a m.

No. 29 leaves Butler 11:45 a m; Renfrew, 12:06; arrives at Callery Junction 12:25; Allegany, 1:55 p m.

Westbound train leaves Callery Junction as follows:

Cleveland and Toledo express 8:35 a m; New Castle accommodation 3:05 p m; Chicago express, with through sleeping car, 1:44 p m; Zelienople accommodation 6:10 p m.

Sunday trains, Nos 23, 26 and 29, run daily. On Sundays No. 24 will run 25 minutes late and connect at Callery Junction for New Castle. No. 29 one hour late and connect at Callery Junction with Chicago express,

Nos. 7 and 17 will run daily between Butler and Allegheny.

No. 50, Sundays only. Leaves Allegheny at 12:40 p m; Callery Junction, 1:50 p m; arrives at Renfrew 2:14; Butler, 2:35.

C. W. BASSETT,
General Passenger Agent.

Dunkirk, Allegheny Valley & Pittsburg.

Going North.	No. 2.	No. 4.	No. 6.
	A M	P M	A M
Titusville.....Lv	7 35	3 20	7 35
Grand Valley.....“	8 03	3 48	8 01
Irvineton.....“	8 45	4 36	8 44
Warren.....“	8 58	4 53	8 56
Junction.....“	9 55	5 45	9 48
Lilly Dale.....“	10 50	6 36	10 37
Dunkirk.....Ar	11 25	7 10	11 12

Going South.	No. 1.	No. 3.	No. 5.
	A M	P M	P M
Dunkirk.....Lv	9 25	4 00	2 40
Lilly Dale.....“	10 03	4 38	3 14
Junction.....“	11 02	5 45	4 08
Warren.....“	11 55	6 44	5 06
	P M		
Irvineton.....“	12 10	7 00	5 22
Grand Valley.....“	12 58	7 49	6 12
Titusville.....Ar	1 20	8 15	6 40

Bradford, Bordell & Kinzua R. R

—AND—

Bradford, Eldred & Cuba R. R.

In effect Jan. 30, 1888.

Westward.				Eastward.		
.....	p m	a m	Ar Lv	a m	p m	.....
.....	5 15	11 50	....Bradford..	7 25	2 25	....
.....	4 40	11 15	Kinzua Junct n	8 05	3 05	.....
.....	4 33	11 08	....Rew City....	8 13	3 12	.....
.....	4 13	10 48	.....Rixford	8 31	3 28	.....
a m	4 08	10 43	..Duke Centre..	8 36	3 33	a m
10 10	3 50	10 25	.....Eldred.....	8 55	3 50	1 25
9 45	3 32	10 10	..Bullis Mills.	9 10	4 05	1 45
9 26	3 17	9 54	.....Ceres.....	9 26	4 21	2 10
8 55	3 04	9 40	.Little Genesee.	9 40	4 35	2 35
8 40	2 55	9 30	....Bolivar.....	9 50	4 45	2 55
7 50	2 28	9 03	...Allentown....	10 15	5 12	3 35
7 00	1 55	8 30	lv. Wellsville. ar	10 50	5 45	4 15
a m	p m	a m		a m	p m	p m
	29	3	N.Y. L. E. & W.	8	22	
...	10 45	2 37	..Hornellsville..	12 12	8 35	.....
....	8 48	11 58	... .Elmira.....	1 50	10 10	...
.....	6 55	11 28	..Binghamton..	3 33	12 44	.....
			Lv Ar			
....	11 30	5 00	...New York...	10 37	7 57	...
	p m	p m		p m	a m	
p m	p m	a m		a m		p m
7 40	....	10 35	ar..Bradford. lv	8 20	....	5 25
7 05	.....	10 00	Kinzua Junct'n	9 00	.....	6 05
6 59	10 02	9 54	.....Aiken.....	9 06	.....	6 11
6 53	.....	9 48	.....Davis.....	9 12	9 23	6 17
6 47	9 50	9 42	.....Simpson....	9 18	.....	6 23
6 35	.....	9 30	....Ormsby	9 30	.....	6 35
6 00	9 05	8 55	..Smethport...	10 05	10 15	7 10
6 00	.....	8 55	...Mt. Jewett...	10 05	.....	7 10
5 15	.....	8 10	... ..Kane ...ar	10 50	.....	7 55
p m	a m	a m		a m		

PITTSBURG & WESTERN.

1 04	.....	.....	.....Clarion.....	1 40	.....	.....
12 32	.....	.....	.....Foxburg	3 25	.....	.....
10 50	.....	.....	.....Parker.....	3 36	.....	.....
.....	.....	.....	.....Petrolia	3 45	.....	.....
9 21	.....	.....	.... Butler.....	5 20	.....	.....
			Lv Ar			
7 20	a m	.....	... Allegheny...	7 20	p m	.....

No Sunday Trains.

JNO. C. McKENNA,
Supt. and Gen. Pass. Agt.

PHILADELPHIA & ERIE RAILROAD.

Time table in effect Nov. 15, 1886. Eastern standard time.

Eastward.	No. 18.	No. 8.	No. 4.	No. 12.
	A M	A M	P M	P M
Erie.....Lv	7 35	.....	2 45	5 25
Corry.....“	9 00	.....	4 13	6 55
Irvineton.....“	9 50	.....	5 00	7 50
Warren.....“	10 05	.....	5 15	8 05
Kane.....Ar	11 25	....	6 30	9 15
Kane.....Lv	.....	6 25	6 55	.....
Johnsonburg.....“	.....	6 58	7 30	.....
Emporium Junction..“	.....	8 30	9 15	.....
Lock Haven.....“	.....	11 15	11 58	.....
		P M	A M	
Williamsport.....“	.....	12 20	1 25	.....
Harrisburg.....Ar	.....	3 13	4 30	.....
Philadelphia.....“	.....	6 50	8 25	.....

Westward.	No. 11.	No. 3.	No. 11.	No. 17.
	A M	P M	A M	P M
Philadelphia.....Lv	.....	11 25	7 40	.....
		A M		
Harrisburg.....“	....	3 30	11 25	.....
			P M	
Williamsport.....“	.....	7 10	2 25	.....
Lock Haven.....“	.....	7 58	3 15	.....
Emporium Junction..“	.....	10 30	6 25	.....
Johnsonburg.....“	.....	12 00	8 02	....
		P M		
Kane.....Ar	.....	12 40	8 35	.....
Kane.....Lv	6 35	1 00	.....	4 10
Warren.....“	7 45	1 58	.....	5 25
Irvineton.....“	7 58	2 09	.....	5 46
Corry.....“	8 55	2 56	.....	6 45
Erie.....Ar	10 10	4 00	....	8 05

Trains daily except Sunday.

Through-car arrangement westward—Erie mail—Pullman palace sleeping cars Philadelphia to Erie, and Philadelphia to Williamsport (cars open to receive passengers at Philadelphia at 10 p m), and Washington to Williamsport. Passenger coaches from Philadelphia to Erie, and Baltimore to Williamsport.

Niagara express—Pullman parlor car Philadelphia to Williamsport.

Through-car arrangement eastward—day express—Pullman parlor car Williamsport to Philadelphia. Passenger coaches Kane to Philadelphia, and from Williamsport to Baltimore.

Erie mail—Pullman sleeper Erie to Philadelphia, and Williamsport to Philadelphia (car open to receive passengers at Williamsport at 9 p m). Passenger coaches Erie to Philadelphia, and Williamsport to Baltimore. Sleeping car Williamsport to Washington.

WHEELING & LAKE ERIE RAILROAD.

Time table in effect Jan. 1888. Central standard time.

Eastward.	No. 5.	No. 7.	No. 9.*	No. 1.*
	A M	P M	P M	A M
Toledo.....Lv	7 45	1 10	4 50	.....
Oak Harbor.....Ar	8 41	2 05	5 45	.....
Fremont	9 06	2 30	6 10	.....
Clyde	9 22	2 47	6 25	.....
Bellevue	9 37	3 03	6 40	.....
Monroeville.....Lv	9 55	3 20	6 58	3 10
Norwalk	10 10	3 38	7 15	3 22
Wellington	11 00	4 32	8 08	4 00
Creston	11 53	5 20	9 05	4 47
	P M			
Orrville.....Ar	12 20	5 48	9 40	*5 15
			A M	
Orrville.....Lv	12 40	5 53	7 05	7 05
Massillon.....Ar	1 20	6 35	7 52	7 52
Massillon.....Lv	1 20	6 35	7 52	7 52
Navarre	1 35	6 50	8 10	8 10
Valley Junction....Lv	2 15	7 40	8 55	8 55
New Cumberland	2 28	7 53	9 10	9 10
Sherrodsville	2 40	8 05	9 25	9 25
Leeesville	2 48	8 13	9 40	9 40
Bowerston.....Ar	2 55	8 20	9 50	9 50
Canal Dover	2 57	6 05	.....	.....
		A M		
New Comerstown	3 38	6 45	.....	.....
Cambridge	4 38	7 45	.....	.....
Macksburg	6 09	9 15	.....	.....
Marietta.....Ar	7 25	10 25	.....	.....

Westward.	No. 5.	No. 8.	No. 4	No. 2.
	A M	P M	A M	
Marrietta.....Lv	6 00	12 10	.....	.....
Macksburg	7 15	1 24	.....	.....
Cambridge	8 57	3 00	.....	.....
New Comerstown	10 00	4 00	.....	.....
Canal Dover	10 42	4 40	.....	.....
Bowerston	11 25	3 45	5 55	.....
Leesville	11 32	3 55	6 02	.....
Sherrodsville	11 40	4 10	6 10	.....
New Cumberland	11 52	4 25	6 22	.....
	P M			
Valley Junction	12 20	5 02	6 45	.....
Navarre	12 50	5 35	7 35	.....
Massillon	1 05	5 50	8 00	.....
Orrville.....Ar	1 40	6 25	8 55	.....
Orrville.....Lv	1 45	*6 35	9 13	.....
Creston	2 18	7 02	9 42	.....
Wellington	3 05	7 43	10 33	A M
Norwalk	3 55	8 25	11 25	7 25
Monroeville	4 07	8 35	11 37	7 35
Bellevue	4 23	9 15	11 55	7 51
			P M	
Clyde	4 39	9 29	12 10	8 06
Fremont	4 55	9 45	12 28	8 23
Oak Harbor	5 20	.....	12 53	8 45
Toledo.....Ar	6 20	*10 45	1 50	9 40

HURON DIVISION.

Northward.	No. 25.	No. 27.		
	A M	P M		
Monroeville.....Lv	.....	.....	.....	.....
Norwalk.....Ar	.....	.....	.....	.....
Norwalk.....Lv	7 00	3 55	.....	.....
Milan.....Ar	7 25	4 20	.....	.....
Friese Landing	7 37	4 32	.....	.....
Huron	7 55	4 50	.....	.....

Southward.	No. 26.	No. 28.		
	A M	P M		
Huron.....Lv	9 10	5 30	.....	.....
Friese Landing	9 25	5 45	.....	.....
Milan	9 45	6 03	.....	.....
Norwalk.....Ar	10 20	6 30	..	.....
Norwalk.....Lv	.....	.....	.....	.....
Monroeville.....Ar	.....	.....	.....	.....

*Daily.

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W. & W. R. R. Time Table.

NORTHW'D. 3	NORTHW'D. 1		STATIONS.		SOUTHW'D. 2	SOUTHW'D. 4
2 00	6 00	Lv	Waynesburg	Ar	10 35	6 25
2 15	6 15		Sycamore		10 17	6 07
2 23	6 23		Swart		10 09	5 59
2 30	6 30		Deer Lick		10 02	5 52
2 38	6 38		West Union		9 53	5 43
2 47	6 47		Dunn		9 43	5 33
2 50	6 50		Lindley's Mills		9 40	5 30
3 01	7 02		West Amity		9 28	5 18
3 06	7 08		Luellen		9 22	5 12
3 11	7 13		Baker		9 17	5 07
3 14	7 20		McCracken		9 13	5 00
3 27	7 35		Vankirk		9 00	4 47
3 40	7 50		Braddock		8 48	4 33
3 55	8 05	Ar	Washington	Lv	8 35	4 20
6 36	9 55	Ar	Pittsburg	Lv	6 10	1 55
			P. C. & St. L. R. R.			

Time given above is Central Standard, which is 40 minutes slower than Pittsburg or local time, or one hour slower than Eastern time.

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Time table in effect Sept. 11, 1887.

Eastward. Westward.

12 Buff Mail	10 Buff Ex.		STATIONS Buffalo Division.		9 Br'd Ex.	11 Br'd Mail
p m	a m				a m	p m
3 30	7 45	Lv	Bradford	Ar	11 15	8 05
3 33	7 48		Kendall		11 12	8 02
3 41	7 56		Limestone		11 04	7 54
3 53	8 08		Carrollton		10 52	7 42
4 08	8 25		Salamanca		10 35	7 24
4 31	8 46		Ellicottville		10 14	7 04
4 40	8 55		Ashford		10 05	6 55
5 15	9 30		Springville		9 30	6 20
6 35	10 50	Ar	Buffalo	Lv	8 10	5 00
p m	a m				a m	p m

Rochester Division.

*2 Acm	4 Rch Ex.		STATIONS.		1 Mail	3† Br'd Ex.
a m	p m				p m	p m
4 55	2 30	Lv	Bradford	Ar	12 30	10 25
5 05	2 42		Limestone		12 18	10 14
5 18	2.54		Carrollton		12 04	10 02
5 30	3 09		Salamanca		11 51	9 49
5 56	3 40		Ellicottville		11 20	9 23
7 22	5 11		Gainesville		9 51	8 00
7 44	5 36		Warsaw		9 27	7 35
8 25	6 20		LeRoy		8 43	6 40
9 25	7 15	Ar	Rochester	Lv	7 50	5 40
a m	p m				a m	p m

Pittsburg Division.

1 Mail		STATIONS.		4 Mail
p m				p m
12 55	Lv	Bradford	Ar	2 15
3 26		Ridgeway		11 38
4 51		Falls Creek		10 14
4 58		Du Bois		10 08
5 59	Ar	Punxsutawney	Lv	9 00
p m				a m

Connections for East and West are made at Rochester with New York Central & West. Shore R. R., and at Salamanca with the N. Y., P. & O. R. R. for Jamestown, Mansfield, Cincinnati, Chicago and the West, at Ridgway with the Philadelphia & Erie R. R. for Emporium, Williamsport, Philadelphia and Baltimore, at Falls Creek with the Allegheny Valley Railroad for Brookville, Reynoldsville and Stations on the Low Grade Division.

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The train, as it stands in the station at Jersey City, is evidently something that the road is proud of. The engine is big. The engineer is that kind of an engineer who starts a train as gently as a mother rocks a cradle, but who, as you will discover when you get there, takes you through the country on schedule time. When the conductor says the "All aboard!" the porters at the car entrances say, "All off that's going," as the officer at the gang plank of an ocean steamer says, "All ashore that's going," just before the steamer starts. Those who have come to see friends off look at them through the broad windows as the train glides out of the station, and quiet, but none the less ardently admiring railroad men, look below at every truck and wheel and journal box, not because it is necessary, for the train has already been inspected, but they like to look at the train and to be sure again that the blossomed pink of the road is in perfect trim for another 1,000 miles run in twenty-four hours.

Outside the cars are gorgeous; inside they are beautiful and luxurious. You may meet on any big road in any part of the country cars as beautiful and perhaps quite as comfortable, but here is a whole train of luxury. The vestibules between the cars are so deftly joined that you cannot discover under foot where the platforms come together, and the carpeted way is lighted by a centre light overhead. In the smoking-room are big, comfortably upholstered wicker chairs, with broad, easy backs and restful arms. Books if you want to read. Cabinets of bric-a-brac, not too profuse. Rooms in which you may play cards; electric bells that will call a porter, who will fetch Apollinaris water, or maybe stronger waters in emergency. Electric lights everywhere. I had neglected to get shaved, but the barber shop on the train afforded comfortable opportunity. It takes a pretty fair sort of a man to shave another on a railroad train at forty or fifty or more miles an hour, but he can do it, though it is not quite so easy as to shave a man on a steamer. However good the road and the rolling stock may be, cars will sway; but the barber establishes a gentle but firm union of himself, the chair and the patient, so that all move together, and the thing is done. You may take a bath on the train if you wish to do so. In the dining car the linen is fine, the food is satisfactory, and the flowers in the brackets on the sides of the car over the ends of the tables are fragrant and beautiful, and when you get to Chicago you wonder what has become of the twenty-four hours.—*San Francisco Correspondence of the New York Sun, Feb.* 19, 1888.

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(90th Meridian.)

NORTHW'D. 6	NORTHW'D. 2	STATIONS.	SOUTHW'D. 1	SOUTHW'D. 5
P. M.	A. M.		A. M.	P. M.
8 05	10 40	Ar....Greenville ...Dp	6 07	3 20
7 55	10 30	.....Shenango	6 17	3 33
7 41	10 17	....Kremis.....	6 29	3 44
7 31	10 08	.....Fredonia.....	6 37	3 52
7 24	10 02	..... Coolspring	6 42	3 56
7 23	10 01	.....Kerby Siding.....	6 43	3 57
7 12	9 50	..... Mercer	6 57	4 08
7 02	9 40	.... Pardoe	7 07	4 17
6 57	9 36	..... Filer.....	7 11	4 22
6 49	9 29	..... Grove City	7 19	4 28
6 46	9 26	..... Reed....	7 20	4 30
6 35	9 16	.....Harrisville.....	7 33	4 41
6 30	9 12	.... Wick	7 37	4 45
6 25	9 07	.....Branchton	7 42	4 50
6 22	9 05	..Coaltown Junction..	7 44	4 52
6 19	9 03	.....Keisters..	7 47	4 55
6 11	8 56	.....Hallston	7 56	5 02
6 02	8 46	.....Euclid.....	8 07	5 11
5 53	8 37	..... Jamisonville	8 17	5 19
5 45	8 30	..... Oneida	8 30	5 25
5 35	8 20	..P. &. W. Junction..	8 40	5 35
5 25	8 15	Dp.... Butler.....Ar	8 43	5 37
		Pittsburg & Western.		
3 30	6 00	..... Allegheny.....	10 30	7 35
P. M.	A. M.		A. M.	P. M.

HILLIARD BRANCH.

10	12	STATIONS.	9	11
A. M.	A. M.		A. M.	P. M.
12 00	7 30	Ar...Branchton....Dp	9 10	6 30
11 50	7 20	.... .. Bovaird.....	9 20	6 35
11 30	6 56	.....Annandale... ...	9 40	7 00
11 20	6 48	.....Roy..	9 50	7 10
11 00	6 40	Dp ...Hilliard.....Ar	10 00	7 20

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Time table in effect Dec. 4, 1887. Eastern time (75th Meridian.)

Train will leave Bradford for

GILLMOR, KNAPP'S CREEK AND OLEAN

Oleau express..... ..... 7:15 a. m.
Buffalo mail .... 2:15 p. m.
Olean express..... 4:15 p. m.
Sunday train..... 9:15 a. m.

FOR DALLAS, RIXFORD AND ELDRED.

Eldred express..... ..... 8:30 a. m.
Eldred accommodation .... 1:40 p m.
Eldred express. .... 5:15 p. m.

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Kinzua accommodation..... 6:30 a. m.
Pittsburg express..... .... 9:15 a. m.
Oil City express..... 4:20 p. m.

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THE PETROLEUM AGE.

VOL. VII. BRADFORD, PA., APRIL, 1888. No. 3.

CHINA OPPOSES OUR OIL.

AN ATTEMPT TO KEEP IT OUT OF THE CELESTIAL EMPIRE.

A SAMPLE of the strong and usually futile opposition of semi-barbarous countries to progress is shown in the sudden effort to bar American kerosene out of China. It is interesting as a curiosity of the nineteenth century. Particulars are here given by a Shanghai correspondent of the Philadelphia *Times*:

For some time past we have been accustomed to hear of periodic outbursts on the part of Chinese officials against the importation of American kerosene oil into their country, professedly on account of its readiness to cause a flare up in the match-box houses of the residents. Nothing until recently has come of these high-flown protests against the oil, which has become a most important and extensive import, and one upon which millions of dollars are annually made by the oil kings in Pennsylvania. The trade has gone on increasing by bounds from year to year. Kerosene has, in fact, become the almost sole illuminant of the Chinese in the open ports and the adjacent towns, and its field is every day increasing. Within the last few days a very prohibitive and malignant memorial against the importation of the oil has been dispatched to Pekin by two high officials in the south of China, namely the Viceroy of the Two Kwang, Chang Chih Tung, and the governor of Canton, Cheng Ping-ch'eng. These two officials are among the foremost of the anti-foreign party in China, and moreover, Chang Chih Tung is the sworn enemy of the great viceroy of the North, Li Hung Chang. The reason for presenting this memorial is ostensibly on account of the frequency of fires caused by the use of kerosene, but there is another argument, and a perhaps more weighty one to the Chinese mind, furnished in one of the paragraphs in the document, which urges "that if America, under the supplementary treaty of 1881, can prohibit Chinese immigration into the States because Chinese cheap labor is there objectionable. China has an equal right to prohibit the importation of kerosene when it is injurious to us."

In this clause, to a great extent, may be found the key-note of the document and its raison d'etre. If the Emperor favorably receives the memorial a great blow will be given to the trade and an immense field closed to American enterprise But although the Viceroy of Canton is a powerful official and any representations coming from him will command a certain weight in Pekin, it would be rash to suppose that be will be able to obtain the Imperial assent to his memorial if proper steps are taken to counteract his efforts.

The memorial states among a number of other examples of recent disasters attributed to kerosene oil a large fire in Swatow, which was caused by the bursting of a lamp and burned for two days, and rendered 500 families homeless. A report from General Tao Ting Sheng, who commands the Bogue district in Canton, which is embodied in the memorial, instances the burning of the ill-fated steamer Wah Yeung, which occurred two months ago in the Canton river, and despite the efforts of the men in the garrison and other vessels the bulk of the passengers and crew, numbering between 700 and 800, were either burnt or drowned, only eighty people being saved. There were 300 women with bandaged feet on board, and of these poor creatures not one was saved. This appaling disaster is attributed to the explosion of a kerosene lamp in the saloon. Another immense conflagration outside the south gate of Canton in November last, in which 1,000 families were burned out and $10,000,000 worth of property destroyed, is cited in the memorial as a fresh example of the danger from the use of kerosene. But I think the figures given above are very much exaggerated. The memorialists state that nine-tenths of the fires in China are attributable to kerosene and then proceed to argue against the importation of the oil in the following delightful examples of Celestial sophism:

"It may be said that the injury done to China by kerosene is more grave than that done by opium, for, although opium is indeed a poison, its action is slow, whereas with kerosene, which is found everywhere, if it once catches fire, it spreads the more you try to put it out—in a moment the neighborhood is in a blaze and life and property are constantly destroyed. * * * We would submit that, by the treaties, foreign merchants are forbidden to deal in sulphur or saltpeter, as these concern the military organizations, or in rice or beans, as these affect the food supply of the people, and that there is precedent, therefore, for articles prohibiting foreigners trading even in Chinese products. They should not, therefore, setting forth as they do that they are friendly States, insist, in order to profit themselves, on harming us and introducing foreign produce shown to be so highly injurious to the welfare of the people. * * * We would request that the Tsung-li Yamen may be instructed quoting the precedent of the supplementary treaty with America of 1881, that on the ground of the injury done to this province to arrange with the American Minister for institution of regulations in the matter, and also that secret instructions may be given to H. E. Chang Yin-huan, Chinese Minister at Washington, to make strong representations to the foreign office there on the subject, to the end that in future foreign merchants may not be allowed to import kerosene, or that they may only be allowed to do so in limited quantities, or that, as has been done with opium, special tariff rules may be established putting kerosene out of the category of ordinary merchandise, leaving China to tax it as it pleases. If this be done in a few years the import will diminish, calamities will largely decrease and native trade will flourish."

It will be observed even by the reader who reads as he runs that the second last paragraph plainly states in effect, if not in so many words, that if the strong representations of the Chinese Minister at Washington do not succeed in bringing about the desired result, namely, the removal of the restrictions on Chinese emigration, the Chinese will impose a prohibitive tax on the importation of American kerosene by foreign merchants. Now it is the Cantonese above all others who are interested in the question of emigration. Nine-tenths of the Chinese in the States come from Canton, for the native of the northern ports scarcely ever extends his travels further than Shanghai, which is the Paris of China. It is said that Chang Chih Tung is using every endeavor to induce other high officials to subscribe to the memorial and Americans here are more than usually anxious about the result, and it is the hope of every one that the Secretary of Foreign Affairs will lose no time in issuing instructions to Colonel Denly who is certain to take effective measures in Pekin for protecting American interests. Colonel Denly has already had some correspondence with Tsung-li Yamen on the subject on account of the high-handed attempt of this very Chang Chih Tung to levy a heavy lekin or war tax on kerosene in his province last year, who hoped by increasing its cost to diminish its consumption. The exact effect of this correspondence has not yet transpired, but one of the results was that the Viceroy of Canton was called upon to make a confidential report upon the subject, which has been done.

It is somewhat of a pity that the exigencies and idiom of English precludes the possibility of doing full justice to the flowery language of this memorial, which is an admirable of the stately flowing and ornate style, which it is the one ambition of Chinese scholars to master. Indeed, in the composition of such documents, the Mandarins pay infinitely more attention to style and expression than to the facts treated therein. For instance, Chang Chih Tung states that he had made inquiries and found that all the kerosene came from America, yet only a month before a consignment of the same kind of oil was landed at Hong Kong from Batoum,

as an experiment towards a further development of trade with that part of the world. But this is outside the present question, and unless the lately discovered oil wells in Burmah, which are in some quarters thought likely to prove dangerous rivals to the American oil-producing States, are developed very suddenly—there is no fear of the oil trade with the States being suspended without antagonistic measures being adopted in China on the suggestion of such officials as the Viceroy of Canton. He seemingly loses sight of the fact that any such legislation as he suggests would only apply to American oil, and the trade would be at once commenced with other places if the Pekin rulers and the American government entered into any such legislation. But there is as yet no dangerous rival in the field, and every one here thinks that the United States government will hardly agree to such measures as Chang Chih Tung proposes.

To prove the growth of the kerosene oil imports from America for the past few years, I quote the following figures from the Imperial Chinese custom report. In these the import to Hong Kong, which is very large, is not given, so that the return is very much under the total mark:

	Gallons 1884.	Gallons. 1886.
Canton	125	238,245
Pakhoi	33,470	32,530
Foochow	17,072	48,000
Ningapo	311,680	393,540
Tamsui	21,000	83,000
Wenchow	1,000	97,000
Shanghai	1,023,470	4,452,524
Chingkiang	286,800	569,190
Wuhu	99,750	210,820
Kukiang	63,000	43,000
Hankow	704,190	823,170
Chefoo	7,322	32,628
Tientsin	132,200	351,420
Total	2,703,079	7,375,067
Increase gallons		4,671,988

From these figures it will be evident that the trade is one of great and increasing importance. Indeed it is one of the few that China when she really comes to that "awakening" of which the Marquis Tseng dreamed in the pages of the *Nineteenth Century* last year, will not be able to keep at home, for she has not, so far as any of the cursory surveys made by European engineers, any oil wells of her own, immense as her territory is, and stretching through every zone as it does. Foreign means of lighting are of the very few things introduced by occidentals to which the Chinese have taken kindly, and the kerosene lamp is now found in the most distant places of the interior. The old tea-oil, bean-oil and colza, hitherto exclusively used by the people for illuminants, have been almost completely superseded by the cheaper and brighter kerosene wherever it is procurable. But the trade is for all that only in its infancy. About a sixth of the total oil import is sent away into the interior from the ports, which can hardly get it fast enough for the demand. It is in some measure true, no doubt, that since the introduction of kerosene there have been more fires in China, but the truth is that this is due far more to the carelessness of the people in using lamps and in the free and easy fashion they store the oil in their kitchens or cook houses than to any other cause. Newcomers to China are usually scared almost out of their wits by the careless fashion in which their house-boys flourish oil lamps about and let them fall every day. A proclamation enjoining caution in this respect would be much more to the point than Chang's memorial for the prohibition of the article. This brief review of the facts of the case may perhaps as well conclude with an extract from a memorial on the same subject recently issued by the Taotai of Hankow, which is an amusing example of the phraseology employed by Chinese officials in their proclamations:

Wherefore know ye all, traders and other people, that in your struggle for a subsistence your first care should be for the security of your lives. If you calculate the amount saved on one lamp during one night in one house, it will not be found to exceed a few copper cash, whereas any chance mishap may cost you several hundred times as much, or more. This is so evident, indeed, as to need no assertion in its support.

Ye should all use your persuasive powers towards warning each other with a view to substituting Eleococca (t'ung) and Brassica (rape) oils. Do not, it is besought of you, risk great things for small gains, and risk bringing a general and severe lesson home to you all! Do not leave ground for future repentance! The Taotai has high hopes of your all paying attention to what he says. All tremble and obey. Do not disobey! A special proclamation.

Russian Petroleum Industry.

In view of the importance of the Russian petroleum industry and the gradual encroachment of Russian naphtha upon markets heretofore exclusively controlled by its great American competitor, the following statistical review and observations covering the years 1883 to 1886 both inclusive, collected and compiled by a most competent authority and kindly placed at my disposal, may not prove devoid of interest or value to those of our citizens engaged in this vast industry in the United States.

At the opening of the Transcausian railway in 1883 great hopes were entertained for the more rapid development of the Russian naphtha industry, for by this means it was conceived to be possible to enter into competition with its powerful American rival in the European and Indian markets; and, indeed, a new life seemed to animate Baku, for the facilities for extracting the raw naphtha were multiplied, while numerous new factories for its refinement were established, and the production showed a steady increase from that period.

As compared with the year 1883, 1886 shows an increased production of over 250 per cent. Not taking into account the local consumption, the export in the former year amounted to less than 150,000,000 gallons—in 1884 it rose to 261,216,710 gallons; in 1885 to 300,149,710 gallons in 1886 it reached the total of 377,006,120 gallons. Notwithstanding these results the expectations anticipated from the opening of a railway were not fully realized, owing partly to the difficulty experienced in crossing the Suram pass, and other unforseen obstacles that temporarily interrupted the traffic of the Transcaucasian railway, and perhaps also because of the continued insufficiency of tank cars, so that a large part of the increased yield of the past four years was again forced back into the home markets by the old route via the river Volga.

By far the greatest portion of all the Russian petroleum has always been shipped from Baku via the river Volga, for its transportation more than thirty tank steamers besides many othar vessels are plying the waters of the Caspian Sea. In the year 1883, 131,595,605 gallons or about 90 per cent of the total yield of the Russian oil wells were sent by way of Astrachan; in 1884, 242,700,915 gallons or about 92 per cent; in 1885, 271,165,995 gallons or about 90 per cent; and, finally, in 1886, 270,845,010 gallons or about 72 per cent, from which figures it is obvious that it was not until the year 1886 that the Transcaucsian railway succeeded in securing an appreciably greater share of the total transportation of Baku naphtha; but it is reasonable to predict that in the future this share will not only be fully maintained, but vastly augmented for the presence of ice interrupts the traffic during about four months of the year, and the bar at the mouth of the Volga prevents the entry of the steamers plying on the Caspian Sea, and necessitates transshipment to smaller craft.

It has already been shown how the Rusian home market was glutted with petroleum, due partly to the many new refineries that were called into existence in Baku after the completion and opening of the Transcaucasian railway, which eagerly bought up and prepared for the market the extraordinarily cheap raw naphtha, but also because of the want of sufficient means of transportation, so that in the beginning of 1886 the accumulation of oil in the Russian Empire is said to have amounted to 40,000,000 gallons, half of this was stored in Zarizyn, the other half in Domnino, (the principal depot of the refineries of Nobel Brothers near Orel,) in Moscow, in St. Petersburg, in Warsaw, etc., mostly in tanks.

In the year 1886, 115,000,000 gallons more were added to this supply, so that the stock for the market amounted to no less than 155,000,000 gallons, only 80,000,000 of this enormous quantity are said to have been disposed of during the year, so that there was carried were into 1887 a stock of 75,000,000 gallons, distributed as follows: In Zarizyn, 25,000,000 gallons; in Domnino, 20,000,000 gallons, and the remaining 20,000,000 gallons in various points in the Russian Empire.

A St. Petersburg newspaper in April of last year stated that the association known under the firm of Nobel Brothers, the largest refiners of raw naphtha in Russia, at the moment of the reopening of the water had 16,500,000 gallons of their own raw naphtha on hand, and that in their reservoir at Baku there was a stock of not less than 6,000,000 gallons of petroleum: 1,675,000 gallons of lubricating oils and residue, and 1,500,000 gallons already loaded and ready for transportation awaited the market.

It is not very difficult to realize that under such conditions the price of raw naphtha has been very much depressed; it fluctuated between $1\frac{1}{4}$ and $1\frac{1}{2}$ copecks (a copeck is 7-77 cents) per pud of five gallons at the wells; the cost of transporting it to the refineries by rail is $1\frac{1}{2}$ to 2 copecks (11.3 to 15.5 cents per pud, or $\frac{1}{2}$ to $\frac{3}{4}$ copecks (.38 to .59) by pipe line making its net cost at the refinery $1\frac{3}{4}$ to $3\frac{1}{2}$ copecks (1.3 to 2.6 cents) per pud.

As $3\frac{1}{2}$ gallons of raw naphth yield one gallon of refined petroleum, and as the employment of the residue, besides affording the requisite heating material, produces also lubricating oil, etc., in sufficient quantity and value to about cover the expenses of refining, it follows that the net cost of a pud of Russian petroleum in Baku is about from $6\frac{1}{4}$ to $12\frac{1}{2}$ copecks (5 to 9.7 cents.)

The market price of prime quality re-

fined petroleum in Baku shipped to Russia via Astrachan was 12 to 25 copecks (9.3 to 11.6 cents) in the latter part of 1886, while in former years it ranged between 22 to 27 copecks (17 to 20.9 cents) then gradually fell to 20 to 24 copecks (15 to 18.6 cents.) and in the beginning of 1886 declined to 15 to 16 copecks per pud (10.8 to 12.5 cents.) Second quality petroleum in the latter part of 1886 sold at 8 to 12 copecks (6 to 9.3 cents.) while in the winter of 1885-86 it still commanded 12 to 13 copecks (9.3 to 10 cents.) and during the period of navigation in 1885 readily sold for 18 to 21 copecks (14 to 16 cents.) It will be observed from the foregoing that under the most favorable conditions, the margin on refined Russian petroleum is merely nominal.

Owing to the immense stocks on hand in the interior of Russia, as has already appeared, the price of refined petroleum in Zarizyn is even lower than in Baku; the freight between these two points is 15 copecks (11 cents) per pud; but notwithstanding this oil at Zarizyn is offered at 25 copecks (19.4 cents) the pud with no takers, this may also account for the fact that in 1886, 5,000,000 gallons less petroleum were shipped via Astrachan than in the preceding year.

As a result of the spare use made of the water routes within European Russia and the high railway tariff, the quantity of petroleum brought into Russia via Astrachan, that was subsequently exported to foreign markets, was comparatively limited; it is calculated that in volume it amounted to 9,138,175 gallons in 1883; 8,466,825 in 1884, and 12,950,000 in 1885, and for 1886 the exact figures are not yet at hand; the destination of these exports in 1883 and 1884 was principally Germany, and since 1885 also Great Britain.

It would appear that owing to the withdrawal from traffic of the tank steamers of the Batoum-Odessa line, the Russian naphtha products have recently been shipped in tank cars via the Prussian frontiers and the Baltic seaports, at a considerable saving in freights is is said.

According to custom house exhibits, the average price per pud of petroleum in the St. Petersburg market in December, 1885 and 1886, were as follows:

	1885. Cents.	1886. Cents.
Russian Petroleum.....	85.5 to 93.2	85.5 to 87.5
In Tanks.....	70	61. to 61.2
American.....	$1.86.6	$1.86.6

From these figures it will be observed that Russian naphtha costs but about one-half of American refined petroleum in the St. Petersburg markets.

On account of the uncertainty in the delivery of petroleum at the Black Sea ports the commerce is greatly injured is obvious, and it is of no rare occurrence that foreign markets are very often overstocked with Russian naphtha, while at other times there may be an actual scarcity. In addition to this freight rates of the Transcaucasian railway are very high. One pud of naphtha product by tank car from Baku to Batoum costs 16½ copecks (12.8 cents); the distance is but 839 versts, or 556 miles. The Russian government, it is understood, has recently taken this matter in hand with a view to remedying the existing defects, and, it is said, proposes to substitute a tunnel for the steep grade of one to twenty of the road over the Suram Pass, while pending its construction and completion work on one or more pipe lines is to be immediately commenced.

Another formidable project is to connect the Caspian with the Black Sea by a pipe line, with vast refineries to be established at Batoum; while yet another proposition is to lay the line to Poti instead.

Of the naptha products carried by the railway by far the greatest part is exported, notably via Batoum. The increase in this traffic has been a most decided one, and no pains or expense are being spared to find new markets outside of Russia.

In 1883 the total exports via Batoum to a few countries was 6,241,070 gallons; in 1884 it had already reached 18,273,525; in 1885, 31,943,890, while in 1886 it had grown to 54,216,455 gallons, an increase of over 750 per cent.

Among the new markets into which Russian petroleum has recently made its entry may be mentioned Syria, Egypt, Algeria, Belgium, Denmark, and East India.

It may be well to mention that it has been maintained—with what degree of veracity I cannot state—that the repeated pumping of petroleum from reservoir into tank steamers and tank cars, and *vice versa*, does not only not occasion any material loss, but on the contrary, by reason of the introduction of air, is said to improve the oil. It would seem necessary to make such statements the subject of a special and thorough study and investigation before it can be positively determined how far compressed air will have an influence on its illuminating power.

The extension of the Transcaspian railway and the consequent opening up of new markets has developed a considerable increase in the consumption of petroleum in the region traversed by the railway, and a still greater demand for Russian naphtha is therefore expected, all the more so as it is proposed to complete the construction of the road. The figures for the years preceding 1886 are not at hand, but in that year the total transactions in the Transcaspian region amounted to 6,917,045 gallons.

The naphtha deposits in the Kuban region yield on an average yearly about 2,500,000 gallons. Half of this is sent overland to northern Caucasia, while the rest is exported by sea from northern Novoorossysk.

In 1885 the following quantities were transported coastwise:

	Gallons.
Petroleum	47,500
Residue.....	1,218,000
Raw naphtha	90,000
Total.....	1,355,500

For the first six months of 1885 the exportation was only—

	Gallons.
Petroleum.....	180,000
Residue.....	70,000
Raw naphtha	55,000
Total	305,000

In the second half of the year the exportation amounted to 805,000 gallons, bringing the total of 1886 up to 1,110,000 gallons, or a decrease of 245,500 gallons.

Between the proprietors of the large refining establishments and their smaller competitors there appears to exist considerable rivalry, and the former often accuses the latter of disposing of their naphtha products at prices that are prejudical to the general markets; on the other hand, the smaller refiners retort by asserting that their more fortunate competitors are flooding the markets with such immense quantities of oil that they can only hope to secure a footing by offering inducements in the way of prices. A movement has lately been inaugurated by which it is expected and hoped to concentrate the sale of the raw naphtha to a few firms, or entrust it to brokers, by which method it is hoped the demand and supply, as well as prices, may be harmonized and regulated.

ERHARD BISSINGER,
BEIRUT, Feb. 8th, 1888. Consul.

The Refined Market.

The refined market for the month of March was not as active as the month previous. The New York, Philadelphia and Baltimore markets remained steady throughout the month, while the refined at the ports of London, Bremen, and Antwerp suffered a decline. At London the prices were quoted ½d lower at the close of the month; while Bremen showed a decline of 20 reichmarks and Antwerp a similar falling off, 3¾ francs. The greatest break in price in the foreign ports was during the last of the month, which was due to the uncertain and sensitive condition of the crude market.

Towards the close of the month a New York writer expresses the following concerning the situation:

The market for refined in barrels for export has not been active but shippers have taken such lots as were required, having no disposition to withhold orders as the freight rates continued favorable while there was no indication early in the week, that the course of the speculative market for certificates would take the turn it has taken and a decline in refined was so near. The price of 70 deg. Abel test remained steady at 7¾c. until yesterday, when a reduction was announced to 7½c. for all loadings, and to-day the price was made 7⅜c., making a reduction of ⅜c for the week. It is not expected that the reduction in price will cause an increase in the demand. The sales reported for the week foot up about 50,000 bbls., mostly for New York loading. The foreign markets are all lower. To-day's quotations by cable were: Bremen, 6 50m; Antwerp, 16f; London, 6½@6¼d, and Liverpool, 6¼@6⅜d. Freight rates continue favorable though slightly higher than a week ago. Hence to London 1s 7½@ 1s 9d is the rate as to vessels, while to continental ports the range is 1s 7d@21 as to port. Home trade lots have not been in active request. On these, prices are weak though nominally unchanged. We quote 8⅝@8¾c for State legal tests; 8@8½c for 110 test; 8¼@8⅜c for 120 test; 8¼@8⅜c for New York City 100 deg. fresh, and 8¾@9c for 150 deg. water white. Western lots are quoted at the same figures.

Cases for export have been in moderately demand, largely for the far eastern ports, the total sales reported amounting to 275,000. The price has been reduced to 9¾c for plain tops. Freight rates continue easy with ample freight room offering. The rates for large vessels are: For Java, 30@31c; Japan, 27@28c; Calcutta, 20@21c; Bombay, 19c; Rangoon, 20c; Singapore, 22½@23c; Hong Kong, 21@22c, and for Shanghai 29@30c.

Crude in barrels for export has been in somewhat better demand with sales reported of about 15,000 bbls. Prices have been reduced to 6⅝@6⅞c, for Bradford and Parker respectively. Cases for export have received very little attention, and only a few small sales are reported. Prices have been reduced to to 8⅝@8⅞c.

Prime city naphtha has remained steady at 7c. For export there has been

a light demand and only a few small sales are reported.

Western residuum, 42@51 deg. test, is quoted at 1½@1¾c f o b. Barrels are quoted at 5@5½. No sales are reported for export.

Mr. Geo. H. Lincoln's monthly circular gives the following figures on the clearances of refined petroleum, in cases, for China and the East up to the 31st of March for the years 1887 and 1888:

	1888 Cases	1887 Cases
China	463,481	504,657
Japan	682,032	760,275
India	355,671	824,457
Java, Signapore, etc	823,234	393,218
Total March 32	2,324,355	2,482,670

REFINED QUOTATIONS FOR MARCH.

	New York	Philadelphia	Baltimore	Liverpool	London	Bremen	Antwerp
	Cts.	Cts.	Cts.	Pence		Reichmarks.	Francs
1	7¾	7¾	7¾	6 9-16@6¾		7.15 20	@20⅛
2	7¾	7¾	7¾	6 9-16@6⅞		7.15 20	@20⅛
3	7¾	7¾	7¾	6 9-16@6⅞		7.15 20	@20⅛
5	7¾	7¾	7¾	6 9-16@6⅞		7.15 20	@20⅛
6	7¾	7¾	7¾	6⅝@6⅞		7.20 20	@20⅛
7	7¾	7¾	7¾	6⅝@6⅞		7.20 20	@20⅛
8	7¾	7¾	7¾	6⅝@6¾		7.20	19¾
9	7¾	7¾	7¾	6⅝@6¾		7.15	19¾
10	7¾	7¾	7¾	6⅝@6¾		7.15	19¾
12	7¾	7¾	7¾	6⅝@6¾		7.15	19¾
13	7¾	7¾	7¾	6⅝@6¾		7.15	19¾
14	7¾	7¾	7¾	6⅝@6¾		7.15	19¾
15	7¾	7¾	7¾	6⅝@6¾		7.15	19¾
16	7¾	7¾	7¾	6⅝@6¾		7.15	19¾
17	7¾	7¾	7¾	6⅝@6¾		7.15	19¾
19	7¾	7¾	7¾	6⅝@6¾		7.15	19¾
20	7¾	7¾	7¾	6⅝@6¾		7.15	19¾
21	7¾	7¾	7¾	6⅜@6½		7.30	17½
22	7¾	7¾	7¾	6⅜@6½		7.30	17½
23	7¾	7¾	7¾	6⅜@6½		7.30	17½
24	7¾	7¾	7¾	6⅜@6½		7.30	17½
26	7¾	7¾	7¾	6⅜@6½		7.30	17½
27	7¾	7¾	7¾	6⅛@6⅜		7.15 17	@17⅛
28	7¾	7¾	7¾	6⅛@6⅜		7.05	17
29	7¾	7¾	7¾	6⅛@6⅜		7.05	17
31	7¾	7¾	7¾	6 1-16@6¼		6.85	16¾

Gas in California.

An exchange from San Mateo publishes the following statement in reference to the discovery of natural gas at that place. Whether there is any truth in the facts stated will be ascertained after the completion of the present developments. This is what it says:

Natural gas was discovered in San Mateo county somewhat over a year ago. An engineer named Bodwell was boring for oil on Tunitas creek on the south side of the hills about nine miles distant from the point on S. L. Jones' place where boring is now in progress. He found a good well and enough gas to run his engine for the remainder of the time he continued boring for more oil. Some time after a seven-inch pipe was inserted in a spring on S. L. Jones' place near Woodside. The water from this spring was very strong from iron, sulphur and other minerals. A thin film of oil was noticed on the surface of the water, and in various other places in the vicinity and from the well appeared bubbles which were originally thought to be carbonic acid gas, but later were known to be combustible—a match being applied to the bubbles they ignited. Work on the spring was pushed, and a depth of 100 feet was reached, previous to which there was a decided increase in the quantity of gas and a deposit of bituminous shale was struck. A small quantity of gas being stored in a gasometer it burned with an intensity much greater than ordinary coal gas, and was found to have neither odor nor color. As the quantity found was not sufficient to be of use, Mr. Jones contracted to have another well bored alongside of the old one, which could not be developed further, as it had not been run straight. A ten-inch pipe will be used, and boring will be done with a steam engine. A positive contract has been made with two contingent additional contracts for 250 feet each. Mr. Jones has been in correspondeuce with gas well contractors east, and if the present plan does not meet with success, which he has no reason to doubt, he contemplates further efforts with the improved machinery used in the natural gas districts in the East. In a letter to the writer last month, after referring to his intentions regarding the work of boring for gas as given above, he concludes: "There is a continual flow of gas from the well which burns very freely, and we have what are considered good prospects; whether realized or not. time and work only can tell."

At Monte Vista (the Ham ranch) bituminous shale has been found, which, when placed in the fire, burned a blue flame. The same formation of rock and conditions exist here as on the Jones place, and it is very probable that natural gas could be found by boring.

On the McCarthy ranch, near Woodside, during the past month natural gas has been discovered, and Mr. Thomas Price, the well-known chemist of San Francisco, has upon examination pronounced it to be of superior quality. Mr. McCarthy is about to begin boring.

Should gas be found in this county in quantities sufficient to be of commercial value, it will be of incalulable benefit to the whole country.—*Scientific Press.*

Petroleum Fuel in New Orleans.

Among the improvements introduced into the plant of the Louisiana Electric Light and Power company of New Orleans is the substitution of crude petroleum for fuel instead of coal. The company has introduced this fuel instead of coal. The company has introduced this fuel under five boilers of its battery of fifteen, and has been using it for the past few weeks with surprising success and great economy in coal, and there is little doubt petroleum will be substituted for coal throughout, so satisfactory has the new fuel proved itself. In addition to decrease in cost, the new fuel promises many other advantages.

The method by which the crude oil is used is described by a local paper as follows: A large iron tank is placed in the boiler-room convenient to the boilers, and at such a height that the oil forces itself through the iron pipes to the fire doors of the boilers, and with sufficient force to discharge itself into the furnace of the boilers through the burner. Each boiler is furnished with one burner, a three-inch cast-iron pipe about twenty-four inches long. The burner consists really of three pipes, one within the other, the space between the outer one and the next largest being used for steam, the space between the second and third for oil, and the middle space for air. Each one of these spaces is connected with a valve to shut off or on the steam, oil or air as desired, and in just such quantities as may be required. The steam ejected from the mouth of the burner gives the draft, the air assists combustion and the oil furnishes the heat and fire requisite for steam purposes.

The amount of heat generated by the use of these burners is extremely great and can be modulated as required. The fire can be extinguished in a second or can be started in an equally short space of time, so that should any difficulty occur to the boilers, engines or dynamos, the fire can be extinguished in an instant almost, thus saving fuel. The services of firemen can be entirely dispensed with, as a boy can light or extinguish the fire by simply turning the valves, and when ready to relight the fires a piece of burning waste is thrown into the furnace, the doors are closed and the steam, oil and air turned on, and in a jiffy there is a roaring fire. There are no cinders, no smoke and no soot, hence the flues in the boilers rarely need cleaning.

Should it be necessary to increase the steam pressure a simple little touch of the valves will increase the heat, or vice versa; should the pressure be too high a reversal of the motion on the valve will modify the heat.

Fuel Gas Notes.

The experiment of burning brick with oil is being continued in the West. The latest process is said to be devised by D. Y. Purington, at his kilns near Blue Island, Ill. To burn a kiln of 200,000 bricks he uses the crude or waste oil, after the naptha has been extracted. This oil is fed from a tank by a two-inch pipe to very simple burners in the arches. The burning was complete in sixty hours. The oil cost 80 cents per barrel, but the quantity used is not stated. One man only was required to handle the fuel and the saving over the old method is estimated at "fully 33⅓ per cent." Successful experiments have also been made near Akron, O., in burning kilns of sewer pipe, tiles, etc.

In burning oil, it is very evident that the two prime necessities are: First, to vaporize the oil without depositing carbon; and, second, to supply air properly for its combustion. Neither of these things has yet been perfectly accomplished, so that there is still considerable room for improvement in order to avoid waste. Some of the results from burning oil show a very great economy, but like everything else, it requires attention. It is cleaner than coal, requires fewer men, is not so destructive to boilers, and admits of keeping the steam pressure at a fixed point without variation.—*The Safety Valve.*

Gas Operations on the Mongahela.

The gas fever has broken out at a surprising rate at different points along the Monongahela river. Nothing else is talked about by the residents. A large amount of territory has been leased at the various points. The Guffeys are said to be the most interested projectors. E. M. Hukill's Hathaway well near Greensboro, struck a large pocket of gas in the Gordon sand on Friday, at the depth of 2,000 feet. At the Parsons well, on Maple creek, a little oil and enough gas to run the engine was found at a depth of 800 feet. Schmertz & Co., of Bellevernon, are putting down two wells, and a Pittsburg company is having a derrick erected on Alexander Carson's farm, near Bellevernon. The work of drilling will be commenced in a few days. The members of these companies have strong hopes of getting oil. Schmertz & Co.'s big gas well on the John B. Carson farm, about a mile and a half from where these new wells are located, was found to contain oil, but not in paying quantities, and it is thought the new wells will strike a paying streak.—*McKeesport News.*

A FINE EXCHANGE.

IN WHICH THE BULK OF NEW YORK OIL TRADING IS DONE.

The new building of the New York Consolidated Stock and Petroleum Exchange was opened, but not formally, on April 16. It is not yet completed. The members marched to the Exchange and gave cheers for President Chas. G. Wilson, A. W. Peters, vice-President, and other officers. The signal for opening business was given on the gong used to call General Washington to his meals at the Washington hotel in Battery place. There were many visitors and the rise in oil contributed to the buoyancy of the occasion.

The building is a magnificent structure and one of the handsomest on lower Broadway. It also faces on Exchange Place and New street. It has a frontage on Broadway of ninety feet, eleven inches; Exchange Place of 132 feet four inches and on New street of eighty-seven feet seven inches. It consists of a basement of fifteen feet which forms the first story on New street, being above the level of that street; a main story of thirty feet of which space twelve feet is used for a mezzanine story.

Above the main floor there are four office stories, entirely distinct from the remainder of the building. The offices, 120 in number, are reached by two extra large elevators of great power, besides several wide stair cases. The offices are handsomely finished in hard wood and there is not a dark office in the whole building, as large interior courtyards insure an unusual degree of light to every room. Tenants of these offices will have spacious and separate entrances on Broadway and New street. A large restaurant will be located in the basement. Steam will be used to heat the entire building. The main floor will be devoted wholly to the Exchange, giving fully 10,000 square feet of room. It will be superbly lighted. The three arches on the south and three each on New street and Broadway give an area of glass equal to 4,500 square feet. A handsome gallery runs around three sides of the big room, affording visitors a fine vantage ground from which to view the struggles of the bulls and bears. The telegraph offices are located in the basement, where they will be easy of access to the members. The building is constructed of Corse Hill Scotch red sandstone and Philadelphia pressed brick, with iron and terra cotta work in portions. The style is Romanesque, eclectically treated, and the building is absolutely fireproof.

The Consolidated Exchange was originally the New York Mining Stock Exchange, which was organized in 1875. By successive absorptions it consolidated with the National Petroleum Exchange, the Miscellaneous Security Board, the American Mining Board and the New York Petroleum and Stock Board, adopting in 1885 its present name of the Consolidated Stock and Petroleum Exchange. The members of the older Stock Exchange do not look with favor upon the growth of their younger rival, but, as one of the Consolidated brokers asks: "What can they do about it?"

In July, 1886, a building company, composed of leading members of the Consolidated, was incorporated, and it is to the efforts of these gentlemen that the great success of the plan is largely due. They are Jerome F. Sadler, president; Alfred L. Faris, vice-president; Francis G. Saltonstall, treasurer, and George W. Hoagland, secretary, and a board of directors consisting of Messrs. John Stanton, Charles G. Wilson, Thomas L. Watson, Jerome F. Sadler, Charles F. Thumm, Robert A. Cheesebrough, Alfred L. Faris, F. G. Saltonstall and George W. Hoagland.

The corner stone of the new building was laid Sept. 8 with appropriate ceremonies before a large assemblage of the members and their friends. There were present President Chas. G. Wilson, who delivered an appropriate address; Mayors Hewitt, of New York; Whitney, of Brooklyn, and Cleveland, of Jersey City; Congressman S. S. Cox, Judge Lawrence, Senator Gorman, of Maryland; representatives of other exchanges; O. D. Baldwin and H. W. Cannon, bank presidents; United States Commissioner Osborne and President Wheeler, of the Bradford Oil Exchange.

Frederick R. Coudert delivered an able address calling attention to the fact that sixty millions of people required greater facilities for transacting their daily business, which this organization having been so quick to realize, was deriving the benefits accruing therefrom; had it not done this, it would not now be able to construct this magnificent building which we here see being erected. He dwelt upon the fact that an active, eager, busy nation cannot be satisfied with the agencies and methods that suited its forerunners. He told the Exchange men that they must expect opposition in business affairs. They had heard the blast of the trumpet of the enemy, but there was only one case on record where the walls crumbled at the blast of a trumpet, and the blast was blown by an angel. Another appropriate speech for the occasion was that of the Hon. Algernon S. Sullivan. He touched a live topic when he spoke of "Trusts," and the members listened closely. He said: "Certain combinations called 'Trusts' are rapidly coming into existence. Their plan is to get control of all corporations which are engaged in some one department of industry. By bringing them under one general controlling superior they pervert the management of these corporations from the hands to which the law committed them. And above all, they lift up impious hands against the law, which, to an American, should even be as sacred as was the Ark of the Covenant to the armies of Israel."

After Dr. Rylance had given the parting prayer, and the singing of the doxology by the Glee Club, a handsome collation was spread at the Hoffman House cafe, in the Wells building.

Read the Answer in the Stars.

We are glad to observe that some one has undertaken to explain the cause of the recent drop in oil from the vicinity of a dollar to about 75 cents. It is now made clear by the explanation of a genius from North Carolina, who writes to a Standard sheet that "the weakness was caused by the opposition of the planet Mars." This, of course, makes the whole

business clear; and its adequacy is demonstrated by the fact that it is the sole explanation of the phenomenon furnished by the organs of the Standard. It is reassuring to be told how the untoward event happened; for without this convincing demonstration there might be folk cruel enough to intimate that the decline was caused by somebody unloading.—*Pittsburg Dispatch.*

THE EXECUTIVE BOARD MEETS.

THE P. P. A. STRENGTHENED AND MORE VICTORIES TO FOLLOW.

The Executive committee of the P. P. A. and other prominent producers held a meeting in Pittsburg on April 19 and 20. Among those noted as being present are H. L. Taylor, of Buffalo; T. B. Clark and R. J. Straight, of Bradford; N. F. Clark, of Oil City, and Rufus Scott, of Wellsville; T. W. Phillips, of New Castle; L. H. Smith, of New York; Capt. J. J. Vandergrift, of Pittsburg; John L. McKinney, of Titusville, and W. J. Young, of Oil City. Nothing official concerning the business transacted has been given out, but the Pittsburg papers devote considerable space to what they have been able to pick up from interviews with the gentlemen. The *Post* has the following: "The object of our meeting to-day," said Mr. McKinney, of Titusville, a member of the Executive committee, "was to meet producers in the Washington and Butler districts and converse with them in reference to the progress made toward the objects sought to be obtained by our association."

"Yes," said Mr. Philips, of New Castle, "and the information we have gleaned is very satisfactory. We can say that we are making very material progress in curtailing the drilling now going on and the drilling that was anticipated. Lately we have received new allies, until now our association embraces about eighty-five per cent. of the producers of the whole Pennsylvania and New York deposit. We have a membership of nearly 2,000 now. We find we are stopping the drills and holding off the drillers to a very considerable extent."

"There has been considerable talk as to the real object of the Protective Association," suggested the *Post* reporter.

"Well, to begin with," replied Mr. Phillips, "the 'shut-down' movement, as it is popularly called, is not a speculative one, but is designed to permanently benefit the producers. We have been selling oil for the year past from forty to fifty per cent. less than it cost us. The way we figure this out is as follows: We ascertain the total amount of money expended over the oil deposit, including money sunk in unproductive wells, shooting, pumping, etc., etc. By carefully prepared statistics a barrel of oil is costing on an average $1.17 and $1.20. These statistics are taken accurately once each month, so we know what we are talking about. Now, the law of supply and demand governs the oil market, and we are seeking to reduce the supply until we get an honest, fair profit on the capital and labor expended."

"There is talk that your organization is weak," was suggested.

"On the contrary," said Mr. McKinney, "it was never so strong as at present. We are constantly being misrepresented by the bears, especially those of Pittsburg. They have misrepresented us as speculators, and we desire to deny that allegation unqualifiedly. It's a legitimate movement, based on honest business principles, to bring about only remunerative prices."

"We might add," said Mr. Phillips, "that the Pittsburg bears misrepresent the field news more than the bears of any other place do."

"How much oil goes to foreign countries?" asked the reporter.

"Two-thirds of the total output," said Mr. McKinney. "People talk of tariff. Why, we are sending ont oil at forty cents per barrel less than the average cost. It's equivalent to paying just that much tribute to the countries buying our oil. In the whole oil field of Pennsylvania and New York we ought to be getting $25,000,000 per year more than we are getting. Two-thirds of that goes to our foreign purchasers."

"How are the outside producers treating you?"

"We have succeeded so well," said Mr. Phillips, "that outside produaers do not fare well, most of them come here to hide. They find little consolation any place but here. We do not understand that all Pittsburg is against us. We have some strong supporters here and they are the best men in the city."

F. E. Boden and E. H. Barnum of Bradfield, non-association oil men were at the Seventh Avenue last evening. Mr. Boden is quite pronounced in his anti-association views.

The *Dispatch* has the following: The members were more inclined to expatiate on the object of the association and the good effect it is having on the oil business than to explain for what purpose the present meeting was called and what business was transacted.

It seems that the committee met in Butler on Wednesday and in Pittsburg Thursday to give the members an opportunity of hearing complaints and consulting with the individual producers on certain matters connected with the association. There are a number of producers not in the association, but who are strongly in favor of the shut-down movement, and they have formed a producers' alliance to aid the association as much as possible. This alliance, and many of the drillers' assemblies, have asked that the Producers' Association be continued after November, so that the supply and demand can be properly regulated, and the market no longer suffer with overproduction. The object is not to shut down entirely, but to limit the amount as those interested may see fit. The proceedings and attendant talk Thursday are concisely reported below:

The committee was in close consultation with individual producers in and outside of the association, getting their views on the subject. They all seem to agree that it is a good idea, and the Executive committee will no doubt recommend that the association should not disband. Whether the Standard Oil Company, which, it is claimed, is tired of its bargain, will sign another compact is a question which they will speedily decide for themselves. Certain it is that if they continue in the movement the association will have to be modified.

There are some members of the association who were granted permits and some outsiders engaged in drilling wells. An effort has been made to induce outside drillers to quit, and the committee has been eminently successful in this respect. The Washington Oil company complained that they were bothered by a few drillers boring on land adjacent to their territory.

The members reiterated the statement that the organization was formed on a legitimate basis, to improve the oil business, and not for speculative purposes. Some of the oil men tried to do a little speculating on the strength of it, but they lost money. They stated further, that the amount of oil above ground in the tanks had been reduced from 30,000,000 barrels to about 26,000,000, since the shut-down movement began, and that the reduction continues at the rate of 1,000,000 barrels per month. When the time is up, the committee expects that the supply on hand will be proportionate to the demand. The bears have tried to take advantage of this large amount of oil in the tanks to make money by selling short, and then claiming that they had made an investment.

Last year oil sold for 64½ cents per barrel, when, by carefully comparing notes and figuring out the actual cost to produce a barrel of oil, it was demonstrated that it required the expenditure of $1.17. The result was that the oil men lost money, and they have started this movement to put up prices to what they ought to be. They said in conclusion that the Pittsburg press opposed the movement on the ground that it was a monopoly, which is a great mistake. In other places the press commended the scheme.

It is hinted that an effort will be made to have a tariff imposed on European oil; but nothing definite as yet has been done.

Oil Cases Decided.

Judge Daniels, of Buffalo, on April 20, handed down his opinion in the case of Charles B. Norton, receiver, &c., against William Macomber. The plaintiff was appointed receiver of the Buffalo Lubricating Oil company on the 16th day of January, 1888, in an action brought by the Manufacturers' & Traders bank of Buffalo against this company for a sequestration of its property under the authority of section 1784 of the code of civil procedure.

His authority was in part defined by section 1793 of the code directing that the judgment in the action must provide for a just and fair distribution of the property of the corporation and of the proceeds thereof among its fair and honest creditors in the order and in the proportions prescribed by law in cases of voluntary dissolution of a corporation. Previous to his appointment and on the 27th of December, 1887, the Lubricating Oil company made a formal assignment to the defendant of three causes of action pending in its favor, one against the Atlas Refining company, another against Hiram B. Everest and Chas. M. Everest, and a third against the Vacuum Oil company, the Standard Oil company, of New York, and others. These actions were assigned to the defendant in trust, and the object of the plaintiff is to set aside this assignment and obtain a transfer of these pending actions to himself as receiver of the company.

The Judge decides that the receiver was entitled to prosecute this action to annul the transfer and secure an assignment and delivery of these actions and rights of actions and is entitled to judgment to that effect in the action.

Judge Daniels also handed down his opinion in the case of the Manufacturers' and Traders' bank against the Buffalo

Lubricating Oil company. The receiver applied for leave to bring action to contest mortgages on, and an assignment made of the property of the defendant. The mortgages encumber to a large amount. The Judge decides in this case that a referee be selected to take proof of the charges made concerning these mortgages and assignments and report to the court, and in the meantime further consideration and disposition of the motion will be suspended.

The First Gas Company.

For some time a very interesting discussion has been in progress through the press of the oil regions as to where the first natural gas company was organized, says the Olean *Herald*. There seems to be a great difference of opinion and no positive decision of the question has, as far as we have seen, been arrived at. As bearing on the question, Mr. Henry White has placed in our hands a letter from Preston Barmore, of Fredonia, directed to his father, the late Hon. Roderick White, of Olean, then State Senator from this district, urging Mr. White to interest himself in the organization of a company at that place to be known as the "Fredonia Gas Light & Water Works Company," which was about to make application to the Legislature for a special charter. Mr. Barmore explained that they could not operate under the general act authorizing the formation of gas light companies "for the reason that we propose by boring down through the slate rock and sinking wells to a sufficient depth to penetrate the manufactories of nature, and thus collect from her laboratories the natural gas and purify it, furnish plentifully the citizens with good cheap light." This letter was dated Jan. 21, 1856, more than thirty-two years ago. When it is remembered that Col. Drake drilled the first oil well in 1859, (three years after this letter was penned) and that natural gas as an illuminator was not used to any extent until 1877, it will be seen that the Fredonia parties were certainly pioneers in the idea of using natural gas, if they were not the very first originators of the plan now in such universal use.

Zoar Roused Again.

In conversation with Jeffrey T. Jeffords, of Gowanda, in regard to the oil operations at that place and in the Zoar field he said to a Jamestown *Journal* reporter: "Excitement is again at its height in regard to recent developments in the Zoar field. There is no question that there is a good oil field being opened up and you may look for lively oil reports from this section at no distant date. New companies are being formed with a view of developing the territory for all it is worth."

"What about the well at Gowanda?" was asked.

"A stock company with 100 shares at $10 per share is being formed, and the stock is rapidly taken, to drill the well deeper. The well at present is down about 1,800 feet. It is believed by competent judges that if a depth of between 2,000 and 2,200 feet is reached the sand in which oil was obtained in the Zoar field, which is reached at this depth, will be obtained. The people are very sanguine in their belief that a good well will be obtained after drilling deeper, and the stock having nearly all been taken it is fair to presume that drilling will be commenced within a week."

OHIO GEOLOGY.

RESEARCHES AND SPECULATIONS OF A PENNSYLVANIA OIL MAN.

MR. W. S. WATSON, of Beaver, Pa., the contractor who has been drilling wells for the Cadiz Oil and Gas company, has furnished the Cadiz *Republican* with an article on the geology of Harrison county. After treating on the coal measure he says:

As with the coal measures in an article like this, we can only speak of the economical value of the formations marking this series in relation to a section in Harrison county.

To mention each particular strata according to its order and value by observations made under many different conditions, the geologists of the State have found it necessary to compile volumes, yet the interesting work of connecting and placing each in its geological importance is but fairly begun.

The Waverly is estimated to occupy 7,000 square miles of the State. It embraces the Logan series, Cuyahoga shale, Berea shale, Berea grit, and Bedford shale. The Logan series consist mostly of sandstone, commonly known to the driller as salt sands, as they generally contain salt water, and sometimes oil and gas, but like the conglomerates of the coal measures it is not expected that a field of importance will be found in them. Some of the shallow oil production of the State has been derived from these sands. At Cadiz we passed through this sand rock at about 1,000 feet. It was found to vary in thickness at the different locations, also in solidity and compactness,—being interwoven with mud veins that always interfere with the process of drilling. It will be seen by the nature of the formations gone through that it was necessary to case the wells to that depth, in order to shut off the water from the numerous sand rocks encountered.

We next reach the Cuyahoga and Berea shale, with a combined thickness of 350 feet. Their importance would not be worth mentioning in this section, if it were not for their making up one of the indispensable elements necessary in the structure as affecting the oil and gas accumulations—the roof or covering of the Berea sand rock that lies immediately under it. The shales being impervious to water, they hermetrically seal anything from escaping from the Berea sand or the descent of salt water from the sand above. The Berea shale lying next to the sand rock is seldom more than thirty feet thick, of a black color, and is said to be very fossiliferous in character.

The Berea sand stone is one of the best known formations of the State. There can be no doubt as to its value as a source of oil and gas supply in eastern Ohio. Its outcrop from near Cleveland, passes west and south through Cuyahoga, Loraine, Erie, Huron, Richland, Crawford, Morrow, Delaware, Franklin, Pickway, Ross, Pike, Highland, and Adam counties at its northern out crop, its highest elevation above the sea exceeds 1,300 feet, and its lowest level below sea on the Ohio river 800 feet, with a prevailing dip of from fifteen to thirty-five feet to the mile, southeast.

It is geologically due in all the countries east of the ones mentioned—varying from five to 100 feet in thickness. It is not only valuable in Ohio as an oil sand, but it is one of the best of the Pennsylvania and West Virginia fields. Thus we have shown a succession of producing oil pools and gas fields, from Franklin, Pennsylvania, to Burning Springs, Wets Va., including all the valuable deposits edvelopde in eastern Ohio. In the test wells at Cadiz, this sand was found to be as persistent as elsewhere, and from fifty to sixty feet thick. That oil and gas is everywhere present in this sand rock, is not true, as is evident from the number of dry holes drilled within the limits described, but that certain existing conditions have accumulated deposits of oil and gas over this wide territory is certain

The question then is resolvable to the the one point,—what are the conditions necessary to accumulate oil and gas? Some conditions in which it would *not* be found, can be readily answered. Certainly it would not be where the rock is fully occupied by salt water; neither would it be where the sandstone is so hard and close grained as not to admit of anything passing through it, or becoming a reservoir for oil and gas. For instance, the Cadiz Oil and Gas company's well, on the Boggs farm. In this well all the conditions seem favorable excepting the latter. The rock was hard and close, admitting only a small volume of gas, but when the aperture was closed, the pressure ran up in a few hours to nearly 200 pounds to the square inch, indicating a great well, providing the rock was porous enough to admit it.

That order of arrangements and structure have everything to do with the concentration of oil and gas at any particular place, is believed by the intelligent oil producer and the practical geologists who have given oil and gas geology attention. But, it is not expected that all who might be interested in explorations of this character would readily take hold of such an uncertainty as the best geological theory could present. Experience is the best incentive to good geological reasoning; and if the experience has been long enough sinking test wells for oil and gas, the investor will be found grasping the slenderest thread of a geological theory that would go to make up the elements of a proper source, reservoir, cover, and structure of his territory.

The shales beneath the Berea sand, at this point, are from 2,000 to 2,500 feet thick, the entire formation being petroliferous in nature. N. W. Lord, of the Ohio survey, has produced two-tenths of one percent of the petroleum from drillings taken from a well. The origin of this petroleum in the shale was derived from vegetable and animal substances that were deposited in or with the shale during its formation, and can be produced from them by destructive distillation. The theory of oil and gas as we find it, is the result of the primary decomposition of this organic matter into oil and gas, or its allied products. The porious sand rock so imbeded making a reservoir in which it is retained.

As to the Ohio shales being a great source of oil and gas, there can be no question. A great deal has been said about the propriety of spending money in drilling below the Berea sand in these thales. Some claiming it as useless, as no sand rocks are known to exist in them as reservoirs. Others value its merits claiming great possibilities from this horzon as a source of supply in eastern Ohio. Some facts in relation to what has been produced from this level can be stated, and the reader can judge what merit their claims have. The shales themselves are found to contain gas in the northeastern

part of the State. Any one conversant with the facts knows that from Cleveland to the Pennsylvania line, there is not a township but in which there has been two or more successful gas wells. True, they are not as large as reported from other districts, but are good paying wells. Again, it is the horizon of the best sands of the group, in the Pennsylvania fields, and in one instance we know of oil being produced from a heavy sand, 700 feet below the Berea sand at George town, on the Ohio river, and within one mile of the Ohio State line. Professor Edward Orton, in a report on the gas field of the northeastern part of the State says, "this formation represents only the lowest beds of the great shale series, and the main supply seems to be derived from the base of the shale."

In all the wells drilled in eastern Ohio, but one has reached the base of the shale, so it is an unexplored territory below the Berea sands.

Happy Effect of Combination.

The following, clipped from the Pittsburg *Press*, shows the effect of the gas combination of Allegheny:

"Natural gas still going up?" calmly inquired one Allegheny citizen of another as the two met on Federal street this morning.

"Oh, yes; going up, up—away up; so very high! Didn't you hear the latest?" suddenly inquired gentleman No. 2.

"No; I've been away a week; but, of course, I supposed it would have gone up a little more, you know."

"Since the two companies consolidated —yes they are consolidated now—they have decided that a man who contracts for gas in the house must contract for it for every room in the house or not contract for it at all."

"Well, you just keep on sleeping that way, but you pay the company regular gas rates for the fresh air. Nou see, the company in this way is establishing a sort of fresh air fund, and nobody should complain against contributing to such a good cause. Fresh air funds have always been considered worthy."

"Oh, yes," resumed the speaker, "the consolidation was a good move. Prices have already 'stiffened' considerably, and I think the gas market will be 'stiff' and 'firm' now right along. The companies have readjusted and rearranged things all around, so that there will be no possibility of their financial failure."

"Have they a mortgage on the town yet?"

"No, not yet. They're getting along right well though. The city had a kind of a mortgage on the companies, but it is all lifted now. The companies have no obligations resting upon them as respecting the city now. Still the business is so risky. The officials are still wearing despondent faces, fearing that the gas may give out, you know, at any minute. They say that the great amount of money invested in the plants is put into a tremendously hazardous enterprise, and that the stockholders should, therefore, be allowed to recover as rapidly as possible upon the principal."

"Oh, of course!"

"Any reasonable person can see that."

"Certainly!"

"Well, the companies propose for their own protection to get back some of this money as soon as possible, and if it can be done pay a nominal dividend of say 12 per cent."

"Only 12?"

"Yes, just one per cent. a month, you know. Still, you would hardly believe it, there are some consumers who are so inconsiderate in this matter. They claim that the gross earnings of the companies should not pay for the plants oftener than once every three or four years. You see they kick on having to pay for the plants about every two years and still not own any of it."

"Strange how some people will complain and without reason," responded speaker No. 1. "There were some people who complained even about the generous terms upon which the companies were given the franchises. Now, what is a city for if it is not to give franchises?"

"Certainly. Some people are actually mean enough to say that the next move of the companies—the company I should say—will be to decline to allow the usual discount on the quarterly bill payable within ten days after presentation. Such a step might be necessary, however, for the company's protection, because the gas is so likely to give out. The business is really so hazardous."

"Tremendously hazardous."

"But I have every faith in the combination."

"And I."

"Now the companies—company I mean —is disposed to do what's right. You know I believed that after ten or fifteen years, when it is demonstrated that the gas is going to stay, the company will commence to declare stock dividends to consumers upon a *pro rato* consumption basis, as a form of rebate for overcharges. At present, however, consumers who don't want to burn gas in all the grates in their house, must either contribute toward the fresh-air fund by paying for those they do not mean to use, or take by meter, paying for each cubic inch actually used. Gas is up two cents a thousand, too, but it had to be so because the character of the business from a financial standpoint is so hazardous."

"Certainly, certainly," and the two gentlemen parted.

The Van Scoy Mystery.

During the early part of the present month a well located on lot 122 in Hamilton township, McKean county, and drilled by Dr. Van Scoy, of Bradford, for some reason only known to the doctor himself had been kept a mystery. To all inquiries the answer was always the same. "When I decide to tell you the facts why then you will know the truth." Like all mystery wells it had its guard. The scout was there and this is the result, for, in spite of all the close guarding, on April 23, the story, as given by a reliable man, was gleaned by THE PETROLEUM AGE. Dr. Van Scoy told the reporter that the well was guarded by a man who slept all day and was wide awake all night, and that it would be impossible for any person to reach the derrick in safety. The watchman must have been broken of his sleep one day, as a man of more nerve and bravery than the newspaper news gleaner crept up to the big tank house, and when the brave guard was fast asleep ripped off a board, measured the amount of oil in the tank and silently stole away in the darkness, leaving the guard to awake and find that a demon had come, fathomed the mystery and fled.

The tank is a 600-barreler, and covered with a tight housing. The well had been flowing spontaneously for five days and had filled the tank up twenty inches, or about 16 barrels per day. Some of the oil is in the possession of parties at Kinzua, and the information given the reporter was from parties who thoroughly understand the oil business, and is given as an accurate report of the well.

The oil is the same color as that of the Washington county oil—a light amber color. The oil was struck 900 feet below the surface, or in the Dew Drop sand, which is of a grayish color and rather full of pebbles. The sand is not yet drilled through. To-day the well will be drilled deeper. It has not yet been torpedoed since the cleaning out of the old hole. Another well will come in this week. The parties to whom it belongs are not known.

This well is situated about five miles above the railroad at Kinzua, and is still closely guarded. There are a few operators at Kinzua who have learned the facts of the well.

What Titusville Drillers Say.

"What do you think of the market today. Isn't she a daisy?" said Chas. Carr, one of the bright lights of the Drillers' Union of this city, "and the recent resolution of Titusville lodge did it, too. Why, we could have gotten our money if we only had asked for it. But what was the sense in making the sale at the price then prevailing? These people who do all the kicking for us ought to at least credit the drillers with common sense enough to know something about their own affairs. By waiving our monthly payment, as we did, we have got the benefit of the rise in the market, which on the 750,000 barrels we have yet at our disposal amounts to $7,500 for every cent advance, so that we are about $30,000 better off now than if we had dumped our oil senselessly on a declining market. And as the market goes up our profits will continue at the same rate.

"Besides this we have another million barrels held in reserve at 62 cents, which is to be sold and the proceeds distributed at the end of the shut-down movement. When storage charges, etc., have been paid on the oil it will come to about 68 cents a barrel, and all over and above that amount will go to us. You see, we are not so badly off as the wreckers try to make us."

"What about the intimation in last Sunday's Bradford correspondence of the Buffalo *Express*, that the P. P. A. would not pay the drillers this month unless more of the oil was sold to realize the fund?"

"Why, that's positively false. We could have been paid at will. But we don't desire to prove a burden on the parties to the shut-down movement, who are all honestly living up to their agreement, and as it would have been pure recklessness to sell our oil out we adopted the wisest course, as you will easily observe."—*Herald.*

The St. Louis Controversy.

At a recent session of the Supreme court held at St. Paul, it was decided that an oil tank wagon was a package and therefore came under the statute that says that all burning oils shall be sold from packages which shall be gauged, stamped and inspected by the Coal Oil Inspector.

Last week a similar case arose in St. Louis. The Waters-Pierce Oil company and the oil inspector of St. Louis have for some time been engaged in a contro-

versy regarding the inspection of oil in tank wagons. The Waters-Pierce Oil company contending that the inspector could only charge for inspecting a package and that a tank wagon was a package in the meaning of the law. The inspector called on the Attorney General of the State for an opinion on the matter. The law requires that all burning oils shall be sold from packages which shall be gauged, stamped and inspected by the Coal Oil Inspector. In his opinion Attorney General Boone says "that what are generally known as oil tank wagons and railroad oil cars are not barrels or packages within the meaning of the statute regulating the matter and no inspector is authorized to brand them as such." Last week the inspector with a number of police went to the yards of the Standard company and prevented the tank wagons from going on the street. The Waters-Pierce company then appealed to the local court for relief, but were refused on the ground that the oil inspector was a State officer and the Supreme court must be applied to.

NITRO-GLYCERINE WORKS.

A VISIT TO A SCOTCH ESTABLISHMENT—THE PRECAUTIONS USED.

THE factory lies in the heart of a great expanse of sandy plain on the southwest coast of Scotland. On approaching it a visitor is hailed by the mounted guard that patrols the environment of the factory, and he will have to show very satisfactory credentials before he is allowed to go further. On the way to the manger's house a village is passed where live the whole of the operatives employed in the manufactory of nitro-glycerine. It is merely a street of small tenements standing on the threshold of the palisades which enclose M. Nobel's house. Some distance from the manager's house is the shed where the practical process of making nitro-glycerine is seen at a glance. Before the visitor gets there however. he is divested of his watch, chain, money, keys, and every particle of metal he may have about him. This seemingly excessive precaution is perfectly necessary, for the fall of even a penny on a floor containing a grain of the explosive might be attended with disaster. Felt shoes have to be worn. In the first shed reached there is a large tank in which are two parts of oil of vitrol and one part of the fuming nitric acid. A cistern above the tank contains glycerine, and when this is introduced into the acid the compound known as nitro-glycerine is at once formed. The operation is, however, an extremely delicate one. The tank is in charge of a workman upon whom the sole responsibility of an explosion rests. If too much glycerine is introduced into the acids at one time, the temperature of the mixture may rise above 77 degrees Fahr., and a spontaneous explosion will at once follow; so that the operative's eyes are never off the thermometer—his own hope of safety lies in keeping down the temperature of the mixture to some 7 or 8 degrees below its explosive heat. He is aided somewhat by ice and cold water which are outside the vat: but the compound is occasionally erratic and will gain heat notwithstanding all precautions. For such a case the only alternative is to move a lever, which lowers one side of the tank, and allow the whole of the contents to run through a sluice into a pond, when it is about an even chance whether it will explode ere it leaves the shed or wait until it reaches the open.

The second step is to wash the newly formed chemical combination in water, which very slightly absorbs it. It is then put into "Winchester quarts" and conveyed with the utmost care into wooden huts or dug-outs. As an instance of the extreme susceptibility of nitro-glycerine to concussion, it is related that a man was once seen to slip in the act of depositing a bottle in a hut: he merely tripped, in the ordinary sense of the word, but there was an instant explosion and hardly a fragment of the poor fellow was gathered for decent burial. Passing on through other sheds, we see the mixture of the nitro-glycerine with a peculiar foraminifesous earth, the new substance being dynamite. This is then carried to a long shed, where it is pressed into cartridges by machinery, the operatives being young women. Not the least curious of the many curiosities at these works are the ponds into which the washing water is run. Tradition has it that the detonative property of the water was not discovered, until an angler one day attempted to seduce the fish with a May-fly. At his first cast, however, the pond blew up, and he found himself some hundreds of yards away, happily unhurt. To obviate a similar danger now, Saturday is reserved exclusively for cleaning the works in every department, and among other things for deliberately blowing up the pond. After congratulating himself on a safe journey through the various houses, the stranger is apt to hurry from the factory and only to breathe freely when he is again at the station. He will not have failed, however, to notice the many precautions taken to insure safety for those who daily risk their lives in these very hazardous operations. Each section of the operatives is distinguished by a peculiar canvas suit with a colored marking; no one may go on any pretence leaving his own department. The women work in felt shoes and bathing-dresses, and every single workman or workwoman is stripped and reclothed before going to their labor. The explosives, too, are handled in the smallest possible quantities, save in the first room of manufacture, where enough is made at one time to blow up a city. The nitro-glycerine itself is a transparent, colorless, oily fluid, slightly soluble in water, but readily so in spirit, ether, or fat. One favorite way of destroying it is by boiling it in potash, when it decomposes, glycerine and niter being formed. Perhaps the most curious use to which it has ever been put is the result of the searching investigations of its medical properties by Dr. William Murrell, who found it almost a specific for angino pectoris, neuralgia and many developments of heart disease.

They Repudiate the Dispatch.

The following resolutions were passed at a recent meeting of the Bruin Lodge, W. D. U.:

Resolved, That we, the officers and members of the Well Drillers' Union, First District, No. 12, do most emphatically denounce the Pittsburg *Dispatch* for using its influence in favor of monopolies and against labor. We pledge ourselves not to patronize it in any way. We also call upon all loyal union men and all others that are in sympathy with the down-trodden and oppressed to assist us in stopping the sale of said paper throughout the Oil Regions.

A Poor Defender.

Ever since the publication of Mr. Dodd's able paper, those who can always be relied on to criticise everything that speaks of the Standard Oil Company in any other wise than terms of abuse or ridicule, have been wrestling with its contents in the faint hope of finding something they are able to combat. Having found nothing they can dispute as matter of fact, in any of his statements, they have turned their attention to finding fault with what he did not say. There is always ample room for this class of criticism, being naturally as boundless as the imagination of the critics. Since the field has been entered upon, the probability arises that it will be cultivated until the readers tire of the palpable absurdities of such disquisitions. Mr. Dodd's paper requires no defense. It speaks for itself and can be understood without explanatory notes, That it has run the gauntlet of unfriendly criticism without an essential statement being contradicted is sufficient encomium for any literary production. Every one interested in knowing the truth about the Standard Oil Trust, should get a copy of Mr. Dodd's paper, and read it carefully.—*Derrick.*

When the Standard organs are not licking the producers' boots they are trying to bulldoze. Could a greater insult be offered to the intelligent people of the oil country than the foregoing? Must it be rubbed into us from day to day that the Standard has never been guilty of acts prejudicial to the oil country; that it has never violated the law; that it has not crushed out competition, all of which is alleged by a clever and quibbling lawyer? What brazen gall, what slighting estimate of the intellectual capacity of this section. Is there a man in the oil country, outside of monopoly affiliations, who does not believe Mr. Dodd has erected a masterpiece of logic at the least possible expenditure of that which is said to be at the bottom of a well? If there is such a man he will form a fair nucleus for a dime museum. The original publication was bad enough; it is an insult to follow it up with such a flagrant utterance as that printed above. Mr. Dodd's work was doubtless intended for outside circulation and influence. Its cunningly worded paragraphs won't go down in the oil country and the less the Hessian press has to say about it the better the people will be pleased, seeing that they are in a state of truce with their ancient enemy. We thought these were piping times of peace, therefore call of your dogs, Brer Rockefeller, and circulate Lawyer Dodd's wonderful production where it will do the most good, say in the Congressional Committee investigating trusts.—*Bradford Daily Oil News.*

Natural Gas and Salt-making.

The practical application of natural gas in salt-making in the Kanawha region, within a week or ten days past, is an instance of the slowness with which man comprehends the resources of nature. For the past seventy-five years the manufacture of salt has been carried on there, at first with wood for fuel, and then with coal, and very often the fuel had to be transported many miles over almost impassable mountain roads, yet all these years the best fuel in the world was going to waste almost under the salt-works furnaces. All the wells sunk for salt water gave off natural gas, which was gathered in a safety pipe, conveyed away from proximity to the furnaces to avoid danger from explosion, ignited and allowed to burn quietly and to no purpose. The use of natural gas in the oil regions of this State had much the same history. For a score of years the natural gas from the wells was allowed to waste itself in the air, while the fuel for drilling and pumping was hauled long distances. Along in the sixties, though, some inven-

tive genius solved the fuel problem by turning the gas escape pipe under the boilers. Now the wells are generally operated by natural gas that they themselves produce. Sometimes the gas is used as a fuel under the boilers, but often it furnishes the power direct to the cylinders. One would have supposed that the Kanawha salt manufacturers would have profited long ago by the experience of the oil operators, even if they did not notice themselves how to make good use of their natural gas.—*American Manufacturer.*

March Production Report.

Reports of the stocks at wells in the Bradford field received by THE PETROLEUM AGE show a decrease of .3 barrels to the well during the month of March. Stocks reported at wells in the Allegany field show a like increase of 2.7 barrels per well. The total number of wells connected with the pipe lines in the Bradford field on March 1, was estimated at 14,100 and the number in Allegany field 4,000. From the above data it is found that the average daily decrease in stocks in the Bradford field was 137 barrels. In the Allegany field it is ascertained by the same computations that the stocks at the 4,000 wells increased 316 barrels per day. The average daily pipe line runs from the Bradford field were 13,378 barrels and from the Allegany field 3,214 barrels. Adding the daily increase in stocks to the pipe line runs the figures are tabulated as follows:

March daily average Bradford runs	13,378
" " " Allegany "	3,214
Total runs both fields	16,592
Decrease Bradford stocks	137
Increase Allegany "	316
Daily increase both fields	179
March's estimated daily production Bradford and Allegany fields	16,771
February's estimated daily production Bradford and Allegany fields	16,865
Decrease in March	94

FEBRUARY PRODUCTION REPORT.

Reports of the stocks at wells in the Bradford field received by THE PETROLEUM AGE show a decrease of .43 barrels to the well during the month of February. Stocks reported at wells in the Allegany field show a like decrease of 1.4 barrels per well. The total number of wells connected with the pipe lines in the Bradford field on February 1 was estimated at 14,100, and the number in the Allegany field 4,000. From the above data it is found that the average daily decrease in stocks in the Bradford field was 209 barrels. In the Allegany field it is found by the same computation that the stocks at the 4,000 wells decreased 193 barrels per day. The average daily pipe line runs from the Bradford field were 13,854 barrels, and from the Allegany field 3,413 barrels. Adding the daily increase in stocks to the pipe line runs the figures are tabulated as follows:

February daily average Bradford runs	13,854
" " " Allegany "	3,413
Total runs both fields	17,267
Decrease Bradford stocks	209
" Allegany "	193
Daily decrease both fields	402
February's estimated daily production Bradford and Allegany fields	16,865
January's estimated daily production Bradford and Allegany field	14,972
Daily decrease in January	1,893

WARREN, FOREST AND LOWER COUNTRY.

Reports were received from groups of wells in the different sections of Warren, Forest and the Lower Country. The number of wells on the 1st of each month, with their averages, are contained in the following statement:

	No. wells M'ch 1	*No. wells Apr 1*	*Av. per well M'ch 1*	*Av. per well Apr 1*
Clarendon and Tiona	67	35	18	15
Cooper District	125	135	14	16
Lower Country	202	106	30	55
Miscellaneous	38	38	49	42

As Macksburg oil is used in the same way as that of the fields of New York and Pennsylvania, there is no good reason why the Macksburg runs should not be counted in the runs of the oil regions. Hence they are included in the outside runs for February and March in making the following estimates on production:

Field.	*February. Barrels.*	*March. Barrels.*
Bradford and Allegany	16,865	16,771
Outside Runs, including Macksburg	25,920	26,134
Total	42,785	42,905
Increase	120	

Compared with the month of March, 1887, there is a decrease of 21,502 barrels. The average daily production for the month of March 1887, including the Macksburg field, was 64,407 barrels.

In the above estimates no account is taken of the "dump oil" loaded on the cars direct from the wells at Emlenton and other points in the region. The Lima runs by the Buckeye pipe lines were 11,081 barrels a day in January, 14,583 barrels a day in February 17,625 barrels a day in March.

The following table shows the comparative production of the New York, Pennsylvania and Macksburg, O., oil fields for 1886, 1887 and 1888:

	1888.	1887.
January	37,723	64,429
February	42,785	63,724
March	42,905	63,392
	1887.	1886.
January	64,429	57,272
February	63,724	57,840
March	63,392	59,764
April	63,447	63,027
May	63,253	68,198
June	62,275	74,454
July	60,005	73,887
August	59,121	76,657
September	60,145	78,228
October	58,942	77,009
November	42,414	72,695
December	40,390	67,790
Total	701,537	826,821

Another Report From California.

Private parties have decided to bore deep, if necessary, for natural gas at Santa Ana. Preparations are being made to bore for it at Whittier, southwest of Chino, in the hills which form a part of the Chino range. The *Graphic* says experts give it as their opinion that it will be found there in paying quantities. The same opinion has been expressed with reference to gas on the Chino ranch, within a few miles of this town.

The Los Angeles papers say that in all but one deep well about Los Angeles evidences of gas have appeared. Gas has been found in some quantities from Santa Barbara all down the coast and inland thirty to fifty miles to near San Diego, along the oil belt. It has been recently found in San Mateo county, near San Francisco, and also in Contra Costa county, in considerable quantities, and development of it commenced. The attention of capitalists is being earnestly turned to gas development, and some very valuable finds may be fairly expected, which will tend to scheapen fuel. Railroads are making all sections available for convenient exploartion and agricultural development. Oil, gas and coal will, like water, be brought to the surface very soon in ample quantities.—*Ex.*

Canadian Petroleum for March, 1888.

The shipments of crude, and refined reduced to crude equivalent, over the lines of the Grand Trunk and Michigan Central railways for the month ending the 31st of March and for the three months just ended amounted to:

	Crude. Barrels.	*Refined. Barrels.*	*Crude Equivalent. Barrels.*
GRAND TRUNK.			
January	15,407	10,855	42,544
February	11,703	7,182	29,658
March	13,173	8,213	33,706
MICHIGAN CENTRAL.			
January	4,075	5,740	18,425
February	4,032	4,576	11,440
March	4,066	4,785	15,028
TOTAL.			
January	19,482	16,595	60,969
February	15,735	11,758	41,098
March	17,239	12,998	49,734

Exclusive Right Denied.

The Supreme Court of Indiana lately decided, in the case of the Citizens' Gas and Mining company vs. the town of Elwood, that the trustees of a town incorporated under the laws of that State have no authority to grant a natural gas company the exclusive right to use the streets of the town for the purpose of supplying citizens with gas, and that a town cannot maintain injunction against another company which is threatening to use its streets for the same purpose upon the ground that it has by agreement granted the exclusive privilege to a different company, but that it may enjoin a gas company from using its streets until such company has procured a license so to do.

Unsuccessful Ventures.

E. R. Andrews has returned from Webb's Mills, Bradford county, where he drilled a gas well under contract for a local company. The well was abandoned at 2,710 feet, they having found a little mineral water at 371 feet and a little gas. This was the second unsuccessful venture in that locality. Mr. Andrews has contracted to drill a well for gas at Waterloo, N. Y., midway between Geneva and Seneca Falls, where there is some gas, said to be 150 pounds pressure. Waterloo is very anxious to obtain the matchless fuel.

A Test of Russian Oil.

The United States Consul at Greece writes the Department of State as follows: "I have already informed the Department of a trial importation by the Greek monopoly of 6,200 cases of Russian petroleum. I have satisfaction now in reporting that this trial has not been satisfactory. The Russian oil is not suitable to this market, and is found to be much inferior even to the low grades of American oil which have been sent here. I have information from the directors of the Greek monopoly that no more Russian oil will be imported. A proper regard for their own interests in sending oil of good quality seems to be all that is required of our exhorters to enable them to retain the command of this market."

IT has been stated on good authority that the distillation of 100 gallons crude petroleum will yield 76 gallons illuminating oil, 12 gallons gasoline, three gallons lubricating oil and five gallons of residuum.

THE PETROLEUM AGE.

DEVOTED TO THE INTERESTS OF THE PETROLEUM TRADE.

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CURRENT COMMENT.

PITTSBURG bears were singing "We're All Surrounded," when the market made its rally last week and began its upward course again. That is true, and they will stand a good show of being taken in by the end of the shut-down if they cling to the promptings of their dyspeptic hearts.

***

THE crude market on the Petrolea, Ont., Exchange closed last month at $1.08, which is an advance of thirty cents in two months. Judging from editorial comments upon the situation the Canadians are quite jubilant, and all they want to complete their happiness are a few pipe lines.

***

IF the shut-down and shut-in movement has been a mistake, it seems rather strange that after five months has elapsed and every producer has had an opportunity to study the present situation that those men in the Saxonburg field who have been drilling all this time should at last join the movement.

***

AT the recent investigation of trusts by a committee of the House at Washington, a mandate was issued from 26 Broadway commanding the investigation to cease, because certain ones of their number were not there. This might be called an audacious display of cheek and impudence. It all depends whose lense you use.

***

THE report that the Eagle refinery had failed has been strongly denied by the proprietors. The cause of the report was the financial embarassment of one of the firm who attempted to get too much of the oleagenous substance under his control. Yet, in spite of this denial, if the facts of the case were known they would show that the profits of the company's pipe line went into the safe of the refinery in order to keep the wheels of that establishment in motion.

***

THE shipment of a cylinder of natural gas to the National museum at Washington, D. C., may be the opening of a new industry. The experiments that have been made in the compression of gases will, in all probability, prove as successful with natural gas. By this method the gas can be bottled and shipped to all parts of the world, and when an inhabitant of Northern Russia wants a little warmth in his home all he will have to do will be to open a bottle of Pennsylvania's natural gas.

FROM present reports it would be a good investment to start salt works at Reibold in connection with the oil industry.

***

THE Producers' Protective Association still lives, despite the great blows that have been aimed at it during the past few weeks. The organization never was stronger. What shows the strength more than any other thing was the shut-down that went into effect in the Saxonburg field a week ago. Here, at the period when the bears and all enemies of the P. P. A. were predicting its immediate dissolution and ruin, another link is added to the chain that is uniting the New York and Pennsylvania producers.

***

FIGURES furnished by the bureau of statistics at Washington are most encouraging as showing the condition of the export trade in oil for March. The exports for that month were 47,294,363 gallons, of a value of $4,110,039, against 43,109,105 gallons, valued at $3,534,942, in March, 1887, an increase of 4,185,258 gallons in the amount exported, and a gain of $575,097 in value. For the nine months of the fiscal year beginning July 1, the exports were 436,414,001 gallons, valued at $34,688,434, against 429,638,232 gallons, worth $34,011,004, in the corresponding time of the previous year, a gain of 6,775,769 gallons, and of $677,432 in value. The decrease in exports in the earlier part of this year is being made good.

An Ingenious Gasometer.

Mr. Norton H. Humphreys, in a letter to the *American Gas Light Journal*, describes an automatic gasometer that will be of much value where the consumer's purse is limited in amount. The letter states that an ingenious inventor, by name R. W. Brownhills, of Birmingham, Eng., has just introduced an automatic gasometer, based on the principle of the machines used for the automatic sale of cigarettes, chocolate, etc. This meter will not pass gas until it has been propitiated by the insertion of one penny in a slit provided for that purpose. It then delivers gas until the equivalent in value of the coin has passed through, and as this quantity is approached the light begins to dwindle and will eventually go out, unless the meter is refreshed by the supply of a second coin. The idea is to facilitate the use of gas amongst the poorer classes, by enabling them to pay as they go on. More than one penny can be put in at a time, if desired, and the corresponding quantity of gas will be delivered, so that a weekly "payment" may be made. The number of coins inserted is registered on a dial, and they are received in a locked receptacle. The collectors are provided with keys, and call to clear the box at any convenient period. Several models of the automatic meter have been shown in public, and they work efficiently. There is something pleasing about the idea of securing the money beforehand, but the system is liable to abuse in many ways. The machinery must necessarily be rather complicated and of a delicate nature, and, as such, would be liable to get out of order; and several ways in which a door for fraud would be opened will suggest themselves. Questions would be continually arising as to whether the machine delivered a fair pennyworth, and judging from the opinions sometimes expressed respecting the ordinary make of meter they would be difficult of settlement. The price of the new make of meter does not appear to be more than that of the ordinary kind, and if it is capable of doing all that the inventor claims on its behalf it certainly is worth a trial.

A USE FOR LIMA CRUDE.

THE OIL TO BE USED FOR ENRICHING WATER GAS.

AT the meeting of the Ohio Gas Light Association at Sandusky the latter part of March, the following paper was read by Geo. H. Christian, of Norwalk, Ohio: In this age of sharp competition and low price for gas, great economies have to be practiced in its manufacture. We must use the cheapest materials at our command and adapt our methods of manufacture to them, especially so in water gas manufacture, where first cost of materials is the main item of cost of gas in holder.

We ask your attention, therefore, to a brief description of experiments, made in our works the past winter, to substitute Lima crude oil for naphtha. We began by mixing small quantities of this crude with naphtha, gradually increasing until we had a mixture almost clear crude, and experiencing no more trouble than from naphtha alone. The gas was improved in candle power, and as free from any smoke or tarry vapors as when using naphtha. We had, previous to beginning our experiment, begun a system of steaming out our works from the hydraulic to holder once every two weeks. This we continue to do, and by this means we kept our works clear and free from any stoppages or back pressure the whole winter. We also continued to clean out our stand and dip-pipes as often as once every ten days. We found that with crude, the same as with naphtha, a deposit of lampblack would form in these pipes, and unless they were regularly attended to they would set up a back pressure and cause us to burn the oil. We used the same heater for the crude as we were using naphtha, but had, however, to change our method of handling the oil in the heater. We found that by leaving the crude oil in the heater between runs it became partially cooked and the heavy oil separated. This oil would make tar the moment it entered the generator. We remedied this difficulty by draining the heater between runs. We were also, for a time, troubled with a burnt oil smell in the gas, which our consumers laid to the crude oil, and they began to cry down our use of it. We finally discovered that one of our valves to the heater leaked and allowed the oil to drop into the generator fire between runs: burning there, it left the smell of burnt oil in the brick, and the gas would carry this smell to the burners.

Our difficulties, as you see, were few and triffling, yet it was some time before we remedied them. These were all our difficulties from handling the oil.

We, however, had another trouble caused by our using the crude, and that was from sulphuretted hydrogen, and we were not prepared to handle that impurity in the quantity which we found it in the gas from oil. We tried lime purification for a long time, with very poor results. Having but one purifying box, we could only use about thirty bushels of lime to a charging, and this would last but a few days, even when it did its

work. It would seldom last two days before the gas would blow holes through the lime and pass through as foul as ever. We could never count with any degree of certainty upon the lime doing its work, and this necessitated the use of other material. We tried Connelly's iron sponge, and with excellent results. Since using this sponge we have had no sulphur troubles. We have one tray of the oxide, about fourteen inches deep, and every four or five days we lift our purifier lid and let it stand up over night. By this we find the sponge revived sufficiently to use again.

We have briefly presented our experiences with Lima oil. The results obtained from it could not be better. We use about five gallons of crude oil per 1,000 cubic feet of twenty-two-candle gas. We think our success in handling this oil without experiencing tar troubles is due to our method of gasifying it. Lima oil, as you no doubt are aware, contains about 50 per cent. tar. This requires that the whole of the oil, the naphtha, distillate, and tar, should be immediately gasified, by using high heats in the generator and superheater. In this way much of the tar is made a fixed gas. The heavier carbon vapors remain in the generator, forming gas carbon in the side of the generator, and the vapors of tar are condensed out in the hydraulic. Some of these vapors pass beyond into the scrubbers and condensers, and are here separated out. The oil should be passed through a steam heater before entering the generator.

Having a highly heated retort in the generator through which the oil must pass before entering the generator chamber is certainly advantageous, but there is danger from its clogging up with carbon forming it, which necessitates its being so placed that it can be readily cleaned or removed. The oil should be forced into the generator so as to be sprayed into the hot brick of the generator and not the fire. In this way you avoid making lampblack.

The outlet pipes from your superheater to hydraulic should be larger than the other pipe throughout your works, as whatever lampblack is formed will remain in these pipes and gradually fill them up. They should be arranged as in our works, so that the natural draught of the apparatus can be passed through them, and in this way burn out the lampblack formed on the sides. This method of cleaning them is quicker and more readily done than scraping them out. The hydraulic should also be arranged with large outlet pipes for cleaning; then, by steaming it at regular intervals, all the tar left there can be taken out or run into a well. In our works we draw down the water in the hydraulic every run, and we have kept our works beyond the hydraulic so free from tar that we use our iron oxide in our purifier without a bottom tray of sawdust or any material to catch the tar: and whenever we have taken out this oxide we have found it free from tar.

There are a number of points to be carefully attended to to make a success of using Lima oil. The oil should be carefully filtered when emptying. Its temperature in storage tank should not be allowed to go below 50 deg. F.; and should your water gas plant require of the oil being admitted into the superheater, it would be advisable to steam the oil thoroughly before using it, ample time being given it to fully settle before using. In this way all the impurities in the oil, together with the heavy, dense oils, known as "b. s." oils, will be settled out, and you will escape trouble from tar and gas carbon forming in the superheated brick. The National gas oil of Lima, Ohio, is, we believe, prepared somewhat in this way, and excellent results are reported from works using this oil. You can also mix the crude with naphtha and rid yourself of tar troubles and carbons. By so doing the naphtha acts as a dissolvent, thinning out these heavy carbons.

There are a number of works in the United States using Lima oil, either alone, mixed with naphtha, or as prepared by the National oil company. The latter oil is used in Springer apparatus at Minneapolis, St. Paul and Chicago. California crude oil is also used at the Los Angeles works. In the Consumers company, at Chicago, the crude is mixed with naphtha in the proportion of 66 per cent. crude to 33 per cent. naphtha. At these works they use the Lowe, Granger and Flannery processes. They also mix the oils at Dayton. In many of the latest improved plants the oil is introduced into the superheater. Whenever such is the case, arrangements must be had to readily change the loose brick in the superheater whenever they become covered with carbon.

It is hardly necessary that we should give you the saving in cost of gas, for you can figure this out for yourself. It does not take any more of the crude per 1,000 cubic feet than of naphtha and the only item of increased cost is for purification. Where iron oxide is used and air admitted into purifiers when making gas, saving the cost of handling the oxide, this increased cost will be but trifling. On the other hand, the oil being less easily burned than the naphtha, a hotter fuel than hard coal, such as gas coke or Connellsville coke, can be used in your generator, and two or three runs taken from one coking, without danger of burning the oil and forming lampblack. In most places this coke can be bought at two-thirds of the cost of hard coal; and in the case of good Youghiogheny coke it will go as far as hard coal pound per pound. The Connellsville coke will go further than hard coal.

In conclusion, we must highly recommend the use of Lima crude oil as being the best and cheapest material at our command to-day from which to enrich or carburet water gas. You can all adapt your works, by means of trifling changes, to its use. Do not expect too much, at first; and do not give up if, at first, you do not succeed. We do not know of another gas works using the clear Lima crude such as is shipped for fuel purposes; but have heard, however, that there were works using the crude alone. The works at Chicago that we have mentioned mix the oil with naphtha because they cannot put their several sets in natural draught often enough or long enough at one time to burn off the carbon on the superheater brick. This could be remedied by having an extra set for every three that are to be constantly in use. It will surely pay to invest in extra sets in all large works where thousands of gallons of oil are used every day.

We have in this paper confined ourselves to the use of this oil in water gas plants. We, however, cannot see why coal gas men should not use the Lima oil as an enricher in the place of naphtha or cannel coal. Highly heated retorts into which the steam-heated crude is sprayed, and from which the gas is rapidly led or exhausted away, are all that is required. A fine jet of steam will spray your oil into your retorts, and also help to carry the gas away rapidly; but far better even than this in all large coal gas works is to put up a water gas set. Use Lima crude and your refuse coke from your coal works and make thirty-candle water gas to enrich your coal gas. You can then run higher heats in your coal retorts, get more gas per pound of coal and make up the loss of candle power with your water gas plant.

New Gas Company.

The report comes from McKeesport that for two years past R. G. Wood and other wealthy men, some of whom are from Pittsburg, have been testing the Versailles and McKeesport natural gas district with a view of forming an immense company or syndicate to open up the districts and control it, making McKeesport headquarters, and arranging pipe lines for marketing the gas in the townships of North and South Versailles, Lincoln, Mifflin, St. Clair, Baldwin, Wilkins, Patterson, Braddock and Sterrett, and also in the cities of Pittsburg, Allegheny and the boroughs of McKeesport, Braddock, Homestead Reynoldton, etc. The company, it is understood, will operate with an immense capital, and will control the new Versailles territory in the way of gas and leases. The prime movers, and those who will apply at once for a charter under the Pennsylvania laws, are as follows: R. G. Wood, James R. Gemmell, John W. Stewart, John F. Davitt and L. C. Haler. The charter will be applied for in a few days. This is no imaginary scheme emanating from fancy, but a gigantic gas enterprise which will develop the new territory, and it can safely be predicted that inside of six months the new Versailles and McKeesport gas field will be pushing Murryville. The company's test wells will show it.

What Capt. Vandergrift Says.

Capt. J. J. Vandegrift left for New York Wednesday, April 4, to attend a meeting of the Executive Committee of the Oil Producers' Association, says the Pittsburg *Dispatch*. The captain stated that some outside producers were still drilling, and that such people would be found in any business. There are those who feel that they can make more money on the outskirts. The flurry in the oil market, he claimed, was caused by speculation, and was not the fault of the association. They organized for the purpose of reducing their stock, and the combination in producing that result is a decided success. Captain Vandegrift was sure that when the year was up the market would not be burdened with a large supply of oil.

The Standard Doing Quite Well.

The annual meeting of the Standard Oil Trust was held April 4, at the office of the company, 26 Broadway, New York. The only business of importance transacted was the election of trustees for the year 1888. The old board was re-elected as follows: J. D. Rockefeller, Wm. Rockefeller, and H. H. Rogers for three years and C. B. Jennings for two years. The annual report which was received at the meeting shows that affairs in the oil regions are in a prosperous condition. Beyond this only the routine business was transacted.

TESTIMONY OF DAVID KIRK

BEFORE THE HOUSE COMMITTEE ON MANUFACTURES.

DURING the first week of the present month the Standard Trust was investigated by a committee appointed for the purpose of investigating trusts of every description. The following is a portion of the testimony presented before the board of examiners:

David Kirk, an oil producer engaged in the oil business at Bradford, Pa, for the last twenty-seven years, was examined by the House Committee on Manufactures Saturday, April 7. The Producers' association, he testified, was a voluntary association and was not incorporated. He was a member of the Executive Board of the General Assembly of the association. There were between 1,800 and 2,000 men in the association, divided into thirty-six local assemblies. He was under oath not to reveal the business transactions of the association, nor the names of the officers, though witness knew no special reason why anything shonld be withheld. Producers of petroleum, dealers in oil well supplies, refiners and persons engaged in business whose interests were supposed to be the same as those of producers were eligible to membership in the association. The constitution of the association was put in evidence. Its preamble states the object of the organization to be to include in one organization all producers of petroleum and those engaged in industries incidental thereto and known to be friendly to the producers' interests, in order that they may by united action and all honorable means protect and defend their industry against the aggressions of monopolistic transporters, refiners, buyers and sellers of their product, in order that the producers may reap the just reward of their capital and labor, and to this end encourage and assist as far as possible the refining and marketing of their product and sale direct to the consumer by the producer. The association had no connection with the Standard Oil company or trust and no member of the trust was admitted into the association, being barred by the constitution and rules. The primary object of the organization was to protect the members against the Standard Oil company.

Chairman Bacon—In what way did the producers need protection against the Standard Oil company?

Answer—The Standard Oil company had secured virtually a monopoly of the transportation, refining, purchase and sale of this article.

Q. How did you expect to overcome or alleviate that condition of things by forming this association?

A. We proposed to refine and market our own product, but the association never refined any oil.

Q. After the organization was formed was any negotiation entered into with the Standard Oil company?

A. Yes, sir. After a great many plans and schemes had been proposed it was deemed best to meet the Standard and see what they could do before we went into a fight. A committee was appointed and negotiations were conducted at Saratoga and Niagara which resulted in an agreement being signed between the association and the Standard in September last. At the conference the Standard attributed all the troubles of the producers to over-supplying and existing stocks which were deteriorating in value and were being carried at vast expense. These stocks were competing with the new product and the Standard said that until the old stocks of oil could be got rid of the producers could not hope to get a fair price for their oil. The Standard's representatives were Messrs. Brewster and Archibald. The average price of refined oil free on board for export was in 1886-7 6¾ cents per gallon. Mr Brewster said that if it were not for existing stocks causing the price of crude oil to be low on the home markets he could get three cents more per gallon abroad for refined oil as easy as he could get the present price. The only foreign competitor was Russia and her oil was inferior in quality, her transportation was limited and the Standard had driven Russian oil out of many European markets. Mr. Brewster said that for every one-eighth cent advance per gallon on refined oil he could give four cents more per gallon on crude. If refined was put up three cents per gallon it would make crude oil worth about $1.64. Witness said a contract was finally entered into by the negotiators. There were about 31,000,000 barrels of crude oil on hand at that time. The Standard said it must be got rid of. The producers desired, in case they reduced production, to get the benefit of the advance on existing stocks, and asked that it be given them at the then market price. After some time the Standard people said they only had 10,000,000 barrels of this oil and agreed to give us half of it at 62 cents, the market price. The producers agreed to reduce production 17,500 barrels a day. In case they carried out this agreement for one year the oil which was held on their account was to be sold and the profits given to the Producers' association to be distributed to each individual producer in proportion to the amount of oil he had "shut in," that is, his reduced production. Of that 5,000,000 barrels 1,000,000 was immediately set aside for the benefit of the labor thrown out of employment. Afterwards another million barrels was secured from the Standard for the benefit of labor. "We thought," continued the witness, "we could wring another million out of the Standard for that purpose and we went to work and did it."

Representative Buchanan expressed his amazement that anyone had succeeded in wringing anything out of the Standard Oil company.

Resuming, the witness said that the reduction in production was secured by means of voluntary signing of individual contracts. About 1,000 men agreed to limi production or "shut in." Others signed contracts not to increase production, and still others agreed not to start new wells or clean out old ones. Some of the contracts were signed by persons not members of the association. Of the 31,000,000 barrels of oil on hand at the time of the agreement over 28,000,000 was controlled by the Standard Oil trust.

The amount of oil on hand had been reduced to 26,000,000 barrels on the first of April. The average daily reduction of production since the contract went into effect in November last had been about 25,000 barrels, of which 18,500 barrels was the result of the "shut in" contracts. The reduction of production was chiefly due to the contracts, but there had also been a natural shrinkage. A careful calculation made this year showed that it cost $1.15 per barrel to bring crude oil to the surface. The oil producers were $10,000,000 poorer last November than a year previous.

Q. Did you at any time make a statement fixing the price at which oil could be produced at a profit at forty cents per barrel?

The witness at first answered no, but afterwards asked leave to make an explanation and said: "From 1878 to 1884 we had wonderfully prolific territory. We could lay out and locate wells like rows of corn, and every well would be a success. Thus large stocks, at one time amounting to 40,000,000 barrels, were accumulated. For four years we have been unable to find any such territory. The cost of production may have been very low during the time between '78 and '84. My company paid as high as 50 per cent. a year dividend during this period. Since then we have lost money."

Representative Smith—Would it be a benefit if the pipe lines were owned by the State?

A. It would be a great benefit. The consumer would also be benefited and the price would be fixed by the law of supply and demand. The Standard placed the cost of the lines at $30,000,000. The understanding of the producer is that it never cost them a cent; that the whole system came from earnings. The first pipe was bought on tick and paid for itself before more was bought.

James R. Goldsborough of Bradford, Secretary of the Producers's Protective Association, testified that the association had paid the Well Drillers' Union $85,000 since the agreement was formed. He produced a copy of the contract heretofore referred to between the association and the Standard Oil company, also payrolls giving the amount paid to laborers and several of the individual contracts agreeing to curtail productions.

Mr. Kirk was recalled and asked if there had been any differences between the producers and the Standard regarding the agreement. Witness replied: "Not officially. We understood we were to have their aid and assistance in advancing prices, but we don't seem to have got it. After the drop in oil last week I called on Mr. Brewster and had a conference. Mr. Brewster is a vice-President, but I don't know whether it is of the 'big thing, the little thing or one of the other things.' Refined oil was selling at 7¾ cents per gallon. On that basis we understood we were to get ninety-six cents and it had gone down to seventy-eight." Mr. Brewster said there had been no change in the markets of the world; that he could hold up the price of refined but could not hold up the price of crude and would not try to.

Representative Buchanan—He spoke of his ability to hold up the price of refined and his inability to hold up the price of crude, having crude to buy and refined to sell.

A. That is it. I told Mr. Brewster their giving us 6,000,000 barrels was a bluff; that they had not thought we would organize a rabble and carry the contract into effect.

Ezra T. Howell, of Olean, N. Y., a dealer in oil well supplies, testified that his business had decreased two-thirds during the last four months.

A Standard Settlement Hindered.

The suit of Charles P. Norton, as receiver of the Buffalo Lubricating Oil company, against William Macomber, as trustee of the same company, is on trial before Judge Daniels in the Supreme court

says the Buffalo *News*. A short time ago the Standard Oil company offered the Buffalo company $25,000 to settle all civil actions at law between the two parties. The court granted the receiver leave to accept the offer, although President Matthews of the company strongly opposed it. It appears that previous to the appointment of a receiver Mr. Macomber was designated as trustee of the company to push these actions. He has since held the existing claims against the Standard and refuses to give them up to the receiver. The latter cannot accept the settlement until he gets the claims from Mr. Macomber. He now endeavors to establish his right to them.

Refined Petroleum in India.

In the regular Consular report to the department at Washington, B. F. Benham, the American Consul-General at Calcutta, makes the following statement in regard to the consumption of the American refined oil in India, and the probable influence of the introduction of Russian oil upon the importation of oil from the United States.

For the Indian fiscal year ended March 31, 1886, the total imports of kerosene oil (for illuminating purposes), were 17,461,-875 gallons, valued at $2,469,433.87. "Other sorts"—probably lubricating principally, is set down for the same year at 2,767,475 gallons, valued at $383,200.18. For the fiscal Indian year ended March 31, 1887, the total importation of illuminating oil (kerosene) from the United States, increased from 17,461,875 (in 1886) to 29,144,765 gallons, valued at $3,942,-443.97. For this year (1887) the kerosene or mineral oil classified as "other sorts," fell off to the trifling amount of 177 gallons, caused probably by the over stocking of the market with that species of oil. The increase during the fiscal year last past of 11,682,890 gallons, or over 66 per cent., is quite encouraging if it can be maintained. In view of the fact that the value of the imports of kerosene during the year ended March 31, 1887, is 97.2 per cent. of the total value of all imports from the United States to India, it becomes very important that this trade should be carefully fostered and protected, especially by those directly interested. If we lose our export trade to India it will result in the loss of the import trade to the United States, so far as American ships are concerned, as they cannot afford to come here in ballast.

The only way in my judgment that our exporters can maintain the supremacy which they have acquired in the oil trade in the East is by shipping none but good oil in good condition. In this connection I deem it proper to state that in the month of June last two cargoes of oil arrived at this port from New York per British ships Corby and Othello, which were reported to be in a bad and unmerchantable condition.

In conclusion I wish to submit a few observations on the subject of Russian competition (which has recently been assuming a more formidable aspect than heretofore) for the oil trade of India. On this subject I copy from the Government report of the trade of India for 1886-'87 the following: "From Asiatic Russia, that is to say from Batoum, was received last year some consignments of kerosene oil. These were the first and trial consignments of the Baku oil to India. Quantity, 1,577,392 gallons; value, 670,-428 rs. This is trifling compared to the enormous quantities annually received from the United States, and is said tha in Karachi at any rate the importations met with no special favor. But it is the beginning of what may prove a formidable competition with American oil, and perhaps the creation of an extensive trade with Russia. The only other competitor is the supply of mineral oil to India which Russia has in India herself, and here the conditions are such that it will be difficult for India oil (if it should be found in large quantities) to compete with foreign oil struck near the seaboard of the United States and Russia."

Since the compilation of the report from which the above extract is taken, Russian competition has become much more active than heretofore, and for the past seven or eight months largely increased quaintities of Russian oil have been shipped to different ports in India from Batoum. I have made careful and thorough inquiry as to the quality of the Russian oil as compared with that shipped from the United States, and with the exception of the unfortunate cargoes of the "Corby" and "Othello," hereinbefore referred to, I find that the Russian oil is of a materially inferior quality. It gives out more or less smoke and requires better ventilation to burn it properly than is afforded by the ordinary burners in use here. Yet, on account of the extreme poverty of a large majority of the native population in India who have of late years adopted the use of kerosene as an illuminant instead of the inferior vegetable oils formerly in vogue, cheapness in price with many of them is a greater inducement to purchase than superiority of quality. And in this way and for various reasons Russian oil is gaining a foothold in India. I am also advised that unscrupulous dealers are in some instances transferring inferior Russian oil into empty American tins, which are very abundant in this country and selling the contents as American oil.

I have recently received a letter from our Consular agent at Rangoon, bearing date the 3d instant, calling attention to the fact that a firm of oil merchants in Rangoon are putting inferior Russian oil in "Devoe & Co.'s" tins and selling the same as the American oil of that brand. Notwithstanding the increasing competition from Russia and the fraudulent practices of retail venders, above alluded to, if proper and available steps are taken to suppress the fraud it is my judgment that we can for many years to come keep the lead in the petroleum industry of the country.

Dodd's Work.

The Pittsburg Press, in commenting on S. C. T. Dodd's new book, "The Standard Oil Trust," says. "Since the days of the East India company no corporation has been more savagely assailed than the Standard Oil company, or Standard Oil Trust, as it has come to be called. Yet, through all the attacks that have been made upon it in legislative halls, through the newspapers and by rivals in trade, the the great monopoly has preserved a calm and haughty silence, bred of fancied immunity and conscious power. True, it has had its defenders and its champions, but these have not occupied an enviable position before the public; lacking, as they have, recognition as official mouthpieces, while suffering charges and insinuations regarding their motives that have not always been unjust. But the time has come when the Standard is compelled to speak in its own defense. The popular outcry against trusts is forcing lawmakers toward radical steps to check this new species of monopoly, which threatens to swallow up all competition in trade. In the New York legislature bills have been proposed which threaten to strike a fatal blow at the vast interests of the Standard in that, and incidentally in other States. The monster is aroused to a sense of its danger, and sends forth a cry of protest that has commanded universal attention as the first direct defense of its aims and methods that the Standard has ever condescended to make. This defense is regarded as a masterpiece of legal logic. It is the work of S. C. T. Dodd, general solicitor of the Standard, formerly a well known member of the Franklin bar. Mr. Dodd earned his present position, with $15,000 attached, by the fidelity and skill with which he looked after the Standard interests in the oil region."

The Lima-Chicago Pipe Line.

Particulars regarding the Standard pipe line to Chicago are obtained from the Lima *Gazette*, which takes a joyous view of the situation: Nearly every train west on the C. & A. railroad has carloads of pipe for the line and a quantity is piled up on the Zurmehly farm, ready to begin operations on the east end of the line. On April 9 forty-eight sets of tongs, for twisting and handling pipe, arrived in Lima, enough for eight crews of 21 men each. Pipe line men from Cygnet are reporting here for orders and arrangements are being completed for a vigorous prosecution of the work. Early Monday morning one crew left for Huntington, Ind., to commence the work of distribution and are working westward along the line. A complete survey of the line makes the pipe line 208½ miles in length. It follows the C. & A. railroad track the entire distance, except one link of 12 miles, in which a cut-off saves a number of miles distance. The line will be divided between the pumping stations, in four sections, and in less than 60 days oil will be pumped from Lima to the great reservoirs at Englewood and thence distributed through the great city by the lake among the furnaces, foundries and steel works as a fuel. We publish the above for the benefit of our readers, even with the knowledge that it will startle our contemporaries and disgruntle the Standard. But our duty is to give the news, and we'll do it even if the baby act is plead by those who can't keep up with the procession, and cry out you'll retard (?) the great enterprise! Retard nothing; it's our aim to forward every enterprise that builds up Lima, and we have stuck to the pipe line till now we see it is a success.

The Standard Oil Company will soon have a little kingdom of their own on the south of Lima. In addition to the 600 or 800 acres they have already purchased they yesterday purchased the Hart and H. C. Adgate farm adjoining the Zurmehly farm, paying for it in the neighborhood of $125 per acre. The land was surveyed on Monday and yesterday the purchase was made. The object of the purchase is to secure more tank room.

The Fowler Oil company finished their No. 3 on the Jacob Reichelderfer yesterday. They struck the sand Monday afternoon and when down about 12 feet struck a heavy vein of grease. By morning the well had had put 75 barrels into the tank, when the work of drilling

deeper was commenced. The drill penetrated the Trenton 15 feet and increased the flow. Mr. Knox thought the well good for 200 barrels. Perhaps no three wells drilled in succession by any company on the same farm have shown up like those of the Fowler Oil company. They have drilled three wells this year on the Jacob Reichelderfer lease none of which have had a taste of glycerine. No. 1 and 2 are doing 100 barrels each and have been drilled in two months. Especially have they a lucky strike as they are in territory considered as spotted and proof of this statement is furnished on all sides. Hover Bros. & Spear, with their wells on the Kemper, northeast of there, know the strength of this statement. Joe Evans, north of there, has just finished a small well, and Sproll drilled two wells on the Shaffer to get one good one. No. 3 on the Reichelderfer is within 500 feet of Sproll's 250 barrel well. Geo. Fowler, whose name the company bears, takes his good fortune very gracefully. It is his first venture as a producer and he is supposed to be the mascott of their success.

Salt, Oil and Gas.

J. B. Fox, of Farmington, W. Va., sends THE PETROLEUM AGE the following description by J. J. Burns of the resources of Marion county, that State: The drilling of twelve wells in this county has proved that salt, oil and gas does exist in paying quantities. The first well for salt was put down in 1829, at the mouth of Hawkinberry run, three miles north of Fairmount, on the bank of the Monongahela river; and many of the older citizens will remember that salt was successfully manufactured there. The men who had the well drilled told me that after making salt for a time, they thought by drilling deeper they might get a stronger flow of water; so they started the drill, but had not gone over fifty feet before they struck a stinking substance that gave them great trouble. Some days it would be from three to four inches deep on their salt water tank, which was four feet wide and sixteen feet long. In some way they found that it would burn, and they dipped it off with buckets and used it under the salt pan. They now know it was oil.

In 1865 I leased the farm on which this well was located, and got a practical salt manufacturer to aid me in an investigation of the deposits. We found the well to be a four-inch hole down to a depth of 400 feet, where they dropped off and only made it a scant two-inch hole to an additional depth of 198 feet, so that the well had a total depth of 598 feet. We cleaned it out and made a six-inch hole down 702 feet, and then concluded to test it before going deeper. We set our pump at 460 feet down, and one morning began pumping, and by night had all the water out and were pumping thick mud. We stopped for the night and next morning discovered that the well had caved in just below our pump. We spent two months in an effort to clean it out, and in doing so got three sets of tools fast and had to give it up. John Cowan, who drilled for us, told me he found a fine grit oil rock 61 feet thick. So much for that.

The next well put down in this county was in about the year 1835, on the West Fork river, just below what is now known as the Gaston mines. The well was sunk by a Mr. Hill, of Armstrong county, Pa., who said he found salt water of the purest quality and in great quantity, same as in the first well. He died just after the well was finished, so nothing was ever done with it. About the time this well was completed a well was drilled in the Morgan settlement, just below Rivesville. Good, pure salt water was found with great quantities of gas.

Some twenty-five years since the farmers on Little Bingamon creek formed a company and drilled a well—I think to a depth of 800 feet—in which they claim to have found oil in paying quantities. I know you can go to it to-day and get oil out of it. The President, Mr. Hess, a very reliable gentleman, told me he saw oil spout out of the tubing some forty or fifty feet, just as they started the pump to test it. The company got to quarreling among themselves, some of the stockholders died and part of the stock got into the hands of minor heirs, so I think nothing has ever been done with the enterprise.

In the fall of 1885 this well got to spouting quantities of oil, so you see the oil wants to get out of it and they won't let it. This well is ten miles west of Fairmont, air line.

I think it was in 1880 that a company, called the Marion Oil Company, was formed, and drilled a well some 200 yards from the well last named, in which was discovered salt, gas and oil. They thought they had oil in paying quantities. With several others (I think the senior editor was with us) I held my watch and saw it produce three barrels in three hours. Many barrels of oil were taken from this well by people in the country around it, and one barrel of the fluid was brought to Fairmont and given to the people of the Standard Oil Company. Colonel W. P. Thompson told me it was a very fine quality of oil. The company had bad luck, getting the tools lost in the well and spending much time and money in a vain effort to get them out. They drilled another well, some twenty feet from the other, but found the oil rock "bleached" (as the oil men term it) by the great weight of water in the first well standing on the oil rock. They then moved down the creek about a mile and drilled another well, but found the oil rock much thinner and finer grit which proved that they had moved in the wrong direction, and this cleaned out the treasury and stopped further operations. This well proved to be a great blessing to the people on that creek, as it afforded them water for their stock for miles around during the great drouth of 1884-'85-87.

In 1867-'68 the Swisher Bros. drilled a well at the mouth of Little creek, some six miles down the river from Fairmont, and found salt and gas in great quantities. At regular intervals each day it would spout the water several feet high, the discharge coming an hour later each day. The well is only about 700 feet deep. I don't know why they stopped operations.

In about 1865 the Marion Cannel Coal Company drilled two wells on their lands. They found salt water and the wells are both gasing.

I think it was in 1879 that a company from Parker City, Pa., drilling a well at Mannington. I don't know its depth, nor whether gas or salt was found in it or not.

In 1886 Mr. E. M. Hukill, of Pittsburg, drilled a well at a point on the B. & O. railroad five miles west of Fairmont in which salt was found, and at a depth of about 2,700 feet (think of it, half a mile deep), he struck a pocket of gas that threw the tools out of the top of the well —the weight of the tools being 4,900 pounds. The report was distinctly heard four miles away. We can see the light from the burning gas from this place any dark night. Mr. Hukill says none of the wells in this county have been drilled deep enough. I think you may hear of his trying another well in this county the coming summer. In all the above wells salt was found within 500 feet of our nine-feet seam of coal.

After Gas Near Smethport.

It has long been thought and believed that there was an oil belt south of Smethport, on and around the old Haskell property. The late Justus C. McMullen always held to it that there was oil there that some day would be developed. Interests are being revived and two rigs are now being fitted up for action, and the belief is that an oil field will be opened up at this place. The Haskell well was drilled about ten years ago on the Haskell farm. The sand found was 400 feet below the Bradford sand, and a different quality from that of Bradford. The oil was a heavy lubricating quality and was used for oiling machinery. It has flowed periodically ever since, but has never been taken care of. There was another Haskell well drilled about the same time, and that with the same result as the former. About six or eight years ago a well known as the Hamlin well was drilled by two Germans and others about 100 rods east of the Haskell well and on the side hill. In this well there was none of the Haskell sand found, but an excellent quality of the Bradford sand. Inside of four days the well filled up 800 feet with Bradford oil. It was decided to torpedo the well and see what she would develop; but, alas! when they went to the well the next morning to lower the charge of glycerine, behold, the well was plugged with iron, rails and all imaginable truck and to this day it remains the same. The perpetrators of the diabolical act were never heard of. As before mentioned the rigs are nearly completed over the old Haskell well, and within a few days drilling will be commenced for the purpose of obtaining gas to supply the county poor house. Should a sufficient quantity of gas be found in all probability a new well will be drilled. The cleaning out of these old holes will decide when they are torpedoed whether or not there is oil there in paying quantities. There is a splendid gas well about one mile north of these wells, but the nearest oil-producing wells are about five miles distant northwest.

Indianapolis Gas Trust.

The Consumers' Gas Trust company is coming along at a swinging gait. The high-pressure wrought iron pipes have been bought and delivered for the entire system. The directors have awarded the contract for the laying of these pipes. They have closed a contract with the Oil Well Supply Company, limited, of Pittsburg, for fifty miles of six-inch (inside measurement), wrought iron pipe for the low-pressure lines. This pipe is to be of standard weight, eighteen and sevety-seven one hundredth pounds to the foot, to be tested to 1,200 pounds pressure per square inch. The pipe is to be first-class in all respects. It

is to be manufactured by the Reading Iron Works company. It will run in lengths of from 18 to 22 feet per pipe. Six miles are to be shipped within two weeks and the remainder at the rate of three-fourths of a mile per day. Fifty miles of pipe, the amount purchased, is enough to pipe as many miles of street as there are in the district bounded by Mississippi, Peru avenue, Seventh and Morris streets. No time is to be lost in driving to a finish the work which the people undertook in forming the Trust and pledging to it support to the end. Indianapolis is to be saved from fuel monopolists for all time—at least so long as natural gas lasts—as sure as the people know what it is to be free and stand by their pledges.

While this low-pressure matter is being arranged, the question of the laying of the main line is being forwarded. J. C. Gibney, the contractor, to-day telegraphed from Pittsburg to the Trust people: "I have everything in good shape. I will be there to-morrow and be ready to commence at once."—*News.*

A Man Who Spots Gas.

A correspondent in the Ohio oil field writes: At this moment a man is credibly received and passed from town to town accredited from one Mayor to a reigning brother after the manner of more exalted potentates. His name is J. S. Booker, and he comes from no one knows where, and is reputed a stone mason. His particular virtue lies in the muscles at the back of his neck, that rise up and agitate themselves in the presence of natural gas. His own story is that not long ago he had an attack of asthma, which passed away and left him in this highly sensitive state. The story deserves credit for its simplicity. With the whole field of fiction before him, Booker chose only a few simple details, when he might have elaborated a highly ornamental and picturesque narrative.

In the language of the ingenuous Booker, when he passes over a vein of natural gas the electricity runs through his feet, up his legs, along his back, agitates his person, and knots up the muscles of his neck. When these convulsions take place natural gas has been found. It would not be necessary to allude to Booker any further were it not that he gets his hearing, and that of a substantial sort.

He came to Fort Wayne from Delphos, where, on the sort of testimony that carries belief, two flourishing gas wells had been found on the spots where convulsions had gone off. His modest proposition was: Expenses paid, and 25 per cent. of the stock if the expected "gusher" was found. That the gentlemen to whom he addressed himself declined this proposition argued their faith. As skeptics they might have agreed to give him the well entire for the pleasure of the phenomenon. But while the bargaining was going on, the wizard agreed to give a manifestation. A carriage was called. Mayor Muhler, Mr. Charles McCulloch, President of the Hamilton bank, and Mr. Cressler of the Gas Works manufactory, accompanied the wizard It was after nightfall and they drove rapidly along. Suddenly the electricity penetrated the carriage. The man vibrated; the symptoms were upon him. The occupants of the carriage felt for the tumultuous muscles. Of a verity there they were—lively, erect.

"It is natural gas," said the wizard. The carriage rolled along. The driver by orders drove hither and thither, and at length recrossed the same spot. Booker was now blindfolded, but the agitation began, and the same manifestations occurred.

"It is natural gas," said the wizard. The gentlemen were puzzled. Of the truth of the circumstances there is no question.

However, they refused the 25 per cent. proposition and the wizard passed on to other cities and more reasonable witnesses. Such has been the demand for his convulsions that he has placed himself in the hands of a manager. That gentleman makes the preliminary arrangements. Booker is kept in seclusion like the Veiled Lady, emerging only for the great act. His terms are $50 for the experiment and $500 if it proves a success. On this basis he finds takers, and is doing successfully the northern Indiana towns.

Ohio Oil Operations.

The Buckeye Pipe Line Company furnish the following report of the operations in the Ohio oil fields for March:

Lima district	7
Findlay district	8
North Baltimore district	19
Total	34

WELLS DRILLING MARCH 31.

Lima district	10
Findlay district	11
North Baltimore district	17
Total	38

RIGS UP MARCH 31.

Lima district	19
Findlay district	15
North Baltimore district	17
Total	51

WELLS ABANDONED IN MARCH.

Lima district	11
Findlay district	1
North Baltimore district	0
Total	12

Commenting on this the *Gazette* says; Compared with February the operations in March show an increase in the North Baltimore and Findlay fields, while in the Lima field things are about a stand off. Findlay is two behind February in wells completed, but are three ahead of that month in wells drilling. The upper field, however, is the scene of the operating. A glance at the table for this month discloses the fact that the Lima field has taken the back seat in operating, even the Findlay field being ahead of it. That is all right. The Lima producers are sensible in not drilling at 15 cents. If the Findlay producers are satisfied to go ahead, they must exhaust themselves that much sooner, and the advance, when it does come, will be that much the better for the end of the field.

Misery of Ill-Gotten Riches.

The Producers' Protective association of the oil country is not encountering smooth sailing, but has its sea legs on, and as everybody is a veteran "old salt," the prospects for its ultimate success are not dim. Its most serious obstacle is the small band of men who will consult their own private greed to the detriment of the general good. But the law of compensation holds as good in the oil country as elsewhere, and riches gained at the sacrifice of manhood and by subordinating the common weal, are sure to develop wings and fly away, or involve their owner in misery that is worse than abject poverty.—*Jamestown Journal*

Pipe Line Summary.

Following is a comparison of the figures of the National Transit and Tidewater pipe lines for February and March:

NATIONAL TRANSIT CO.

	Barrels.
Acceptances, etc., Feb. 29	17,692,036.33
" " March 31	17,572,036.33
Decrease	120,000.00
Credit balances Feb. 29	6,512,185.42
" " March 31	6,007,675.12
Decrease	504,510.30
Total liabilities Feb. 29	24,204,221.75
" " March 31	23,579,711.45
Decrease	624,510.30
Gross stocks Feb. 29	27,432,972.35
" " March 31	26,860,980.31
Decrease	571,992.04
Sediment and surplus Feb. 29	3,228,750.60
" " March 31	3,281,268.86
Increase	52,518.26
Receipts from all sources February.	946,086.16
" " " March.	1,181,486.72
Increase	235,360.56
Total deliveries February	1,895,200.03
" " March	1,800,284.05
Decrease	94,915.98
Runs from wells February	896,260.69
" " " March	925,107.03
Increase	28,846.34
Regular shipments February	1,847,301.07
" " March	1,764,167.73
Decrease	83,133.34

The total receipts of the Transit Company for March were made up as follows:

Runs from wells	925,107.03
Received from other lines	256,739.69
Total	1,181,846.72

The deliveries for March were made up as follows:

Regular shipments	1,764,167.73
Delivered to others lines	36,116.32
Total	1,800,284.05

TIDEWATER PIPE CO.

Acceptances, etc., Feb. 29	575,000.00
" " March 31	549,000.00
Decrease	26,000.00
Credit balances Feb. 29	646,105.19
" " March 31	639,179.51
Decrease	6,925.68
Total liabilities Feb. 29	1,221,105.19
" " March 31	1,188,179.51
Decrease	32,925.68
Gross stocks Feb. 29	1,375,917.57
" " March 31	1,349,066.88
Decrease	26,840.69
Sediment and surplus Feb. 29	154,812.38
" " March 31	160,887.37
Increase	6,074.99
Receipts from all sources February.	161,916.63
" " " March	151,731.46
Decrease	10,185.17
Total deliveries February	208,475.71
" " March	182,219.45
Decrease	26,256.26
Runs from wells February	114,017.67
" " " March	115,615.14
Increase	1,597.47

The above receipts for March were made up as follows:

Runs from wells	115,615.14
Received from other lines	36,116.32
Total	151,731.46

Oil Syndicate.

The papers were signed April 5 at Detroit, Mich., for the organization of the Ohio Oil Syndicate with a capital of $5,000,000. They will refine oil in Ohio under the Hall patents, and the combination is, or will be, a direct rival and opponent to the Standard Company. The capitalists interested are the executive committee of the International and Continental Oil companies, the capital of which is set at $50,000,000.

OPERATIONS IN MARCH.

Wells Completed, Wells Drilling and Rigs Up and Building in the Entire Region.

WASHINGTON county in 1885 was like a bull in a china shop. What Kane's unnatural development from a sand unknown in the annals of oil had left undone, Washington with its big gushers did. And so effectually was it done that it required two years to get the market back to the dollar line. But it was gotten back there recently and held for some time close under it. Washington straightway reappears with another big gusher. Not so big as the original Dyer well of more than two years ago, but a more unreasonable one, all things considered. A gusher is no novelty in this land of grease. They have come and gone year after year. But they frighten people yet, evidently, and they give people the drill fever. Why, there is Joe Craig, the reigning power in the Chartiers Oil Company, who has owned almost as many gushers as any man, and who has just been recently married. He has the drill fever, and the Chartiers company is making things hum in the vicinity of the Fergus gusher.

The monthly canvass of the fields is not as discouraging as a great many people were led to expect. It has frequently been the case that the trade having its whole attention directed to some spot where operations are increasing, imbibed the idea that operations in the entire field must have been increased, whereas it is a law known to the fieldman, himself many times surprised, that this very attention directed to one spot leads to decrease nearly everywhere else.

That there is a decrease in the total amount of work under way at the close of March, as compared with the small list at the end of February, is the best of evidence of the strength of the producers' organization, an organization that ought to be able to wrest from the foes of the region the profits that justly belong to it. Its demand ought to be law. In the face of the inducements of promising gusher territory and the first mild and enticing spring days the smallest list of operatiods in history is furnished this morning. A month ago we said the prospects were not good for the employment of the non-union driller at the end of March. But for the rush around the Fergus gusher these last few days of the month, at least 20 fewer well crews would be at work than on the first of the month.

The following summaries compare the finished work of two months at a glance:

WELLS COMPLETED.

	March.			February.		
	Wells.	*Prod.*	*Dry.*	*Wells.*	*Prod.*	*Dry.*
Allegany	1	..	1	..	..	..
Bradford	3	11	1	1	8	..
Middle Field	4	12	3	3	18	2
Venango	20	93	5	19	77	6
Clarion	4	43	2	5	28	2
Butler and Armstrong	26	1247	8	17	283	8
Washington	7	1566	2	4	180	2
Greene Co., etc.	1	40	..	7	16	5
Total	66	3012	22	56	610	25
Total Feb	56	610	25			
Difference	10	2402	3			

The following summaries compare the work under way at the close of the two months:

RIGS AND WELLS DRILLING.

	Mar. 31, 1888.			Feb. 29, 1888.		
	New Rigs.	*Wells Dr'g.*	*Total.*	*New Rigs.*	*Wells Dr'g.*	*Total.*
Allegany	1		1	..	1	1
Bradford	1	..	1	..	2	2
Middle Field	2	7	9	1	7	8
Venango	6	8	14	10	17	27
Clarion	3	8	11	2	3	5
Butler & Arm	4	22	26	8	36	44
Washington	14	27	41	7	14	21
Greene Co., etc.	..	3	3	..	3	3
Total	31	75	106	28	83	111
Total Feb. 29.	28	83	111			
Difference	3	8	5			

These tables show an increase in the number of wells finished in March over the preceding month of 10, and the 59 rigs built during the month failed by 6 of making good this increased finishing rate. A study of the figures for January and February show that only 54 rigs were built during the short month, giving this month an increase of 5, which would be slightly larger proportion per diem than the rig building of last month, there being 2 more days. The excess would beat the rate of 2½ rigs for each of the extra days, while the rate for the 29 days was almost 2 rigs a day. New production was largely increased, Saxonburg having 3 wells equaling the production of all the wells finished in February, leaving the big Fergus, Jo-Jo No. 2 and the Guckert to join in making a surplus. The rig account is increased by 7 and the drilling list decreased by 13.

Following are the operations in detail:

WELLS COMPLETED IN MARCH.

Allegany Field.

Location. Owner. Production.

Cuba, William Hallam ..... dry

Wells completed 1
Dry 1

Bradford Field.

Tip Top, Isaac Willetts 5
Erskine, Duke Centre, G N Grow 6
Mt Jewett, Knox Bros & Andrews ..... gas

Wells completed 3
Production 11
Dry 1

Middle Field.

ELK COUNTY, ETC.

Millstone, Wynkoop & Co ..... dry
1464, Barnsdall & Co 12
3212, Beam, Ralph & Co ..... gas
3212, Shultz & Co ..... gas

Wells completed 4
Production 12
Dry 3

Venango.

Buxton, Buxton & Co ..... dry
Bullion, W T Baum ..... dry
Clintonville, Widow Osborn, Osborn Bros 5

SLAB FURNACE, HALL'S RUN, ETC.

McCalmont, Koch Bros 10
Zeigler, Wolf & Shafer No 1 8
" No 2 10
" Bauser & Rapp 9
Rote, Heeter & Co 7
Sayers, " 10
Grant, Kelly & Smullin 10

RED VALLEY.

J Hetzler, H D Brown No 5 6
Batten, A P Dale 2
Hetzler, " 4

VICINITY PLEASANTVILLE.

Vose, M N Miles 4
Stewart's run, K H B tract, Carnahan & Son 3
Hays, W P Black 2
Prather, Innis, Davis & Lee ..... dry
Pleasantville lot, R W Brown ..... dry
Shamburg, Jerome Heald ..... dry
Blank, Black Bros 3

Wells completed 20
Production 93
Dry 5

Clarion.

Buzza, Heeter & Kugler ..... dry

CLARION BOROUGH.

Greenland, Rider & Co ..... dry
Water Tank lot, Kifer, Fall & Co 40
P & W R R, Semple & Co 3

Wells completed 4
Production 43
Dry 2

Butler and Armstrong.

Todd, (Buffalo Creek) Reep & Sutton ..... dry
William Bromfield, Davis Bros 5
Bromfield, R. Jennings 20
Sharpe, Neibert, Fox & Still ..... dry
Black, Dulity Bros 10
" Hagerson Bros 6
Musbrush, Wise & Co 25
Reiber, Reiber, Clark & Co ..... dry
Gumper, Gumper 25
J Black, D Burns & Co 15
Hildebrand, Neff Bros ..... dry
McLaughlin, Frazier & Co ..... dry
Mahan, Marshall Oil Co 10

REIBOLD.

Galebaugh, Connors, Fishel & Bredin No 2. 10
" Guckert & Co 240
Boggs, Glatzau & Coast 33

BRUSH CREEK.

Davis, Jennings, Roth & Co ..... dry
Pine Run, McGrew Bros ..... dry
Jamison's Mills, McGranahan ..... dry

SAXONBURG.

Crawford, Haymaker & Co No 1 288
Aderhold, Golden, Wuller & McBride 70
J H Lonitz, Bolard, Greenlee & Co No 4 40
H Lonitz, " No 2 168
Widow Lonitz, " No 2 ....
Englehart, Urquhart, Lavens & Co 42
Foercht, " 240

Wells completed 26
Production 1247
Dry 8

Washington.

Miller, Marshall Oil Co. 10
Fergus, S. P. Fergus 1296
Munce, I Willetts & Son No 30 20

CANONSBURG.

Gilfillan, (Sodom) Philadelphia Co ..... dry
McPherson, John A Snee & Co ..... dry

TAYLORSTOWN.

Crothers, Caldwell & Co 40
Hilton, Ellsworth & Preston No 2 200

Wells completed 7
Production 1566
Dry 2

Greene County.

Donelly, (Mt Morris) Alexander & Co 40

Wells completed 1
Production 40

WELLS DRILLING, RIGS UP AND BUILDING APRIL 1, 1888.

Allegany Field.

Farm. Owner. Condition.

Wirt, Isaac Willetts ..... rig
Alma lot 4, Breckinridge & Co (shut-down) . 1200
Clarksville lot 10, Steele & Fields (old rig)
Scio lot 46, L G Norton (old rig) .....

Rigs up and building 1

Total 1

Bradford Field.

Foster Brook, E T Co, T Kerwin & Co (old rig) .....
Lot 122, Armstrong & Co ..... rig

Rigs up and building 1

Total 1

Middle Field.

CLARENDON.

Lot 532, C A & D Cornen No 5 (shut down). 900
532, Goal Bros (old rig) .....

TIONA.

Lot 109, J W Sherman.....sand

CHERRY GROVE.

Lot 661, A J Carroll..... 1000

GLADE.

Elliott, McGee & Co..... rig

HARMONY TOWNSHIP, FOREST COUNTY.

Shriver, Shriver & Co (fishing)..... ... 800

GRAND VALLEY.

Grove, Grove Bros.....drilling

MISCELLANEOUS, ELK COUNTY, ETC.

3663, Elk Oil Co No 4 (shut down)... 2300
2032, Boggs, Rosenberg & Co.....sand
2260, Wilcox Oil Co No 6.....1100
" " " No 7 ..... rig
5505, (Forest) Shannon Syndicate (shut down).....1675
5697, Clarion river, James C Welsh....mystery

Rig up and building..... 2
Wells drilling..... 7

Total..... 9

Venango.

Miles, (Cherrytree) Buxton & Co 500
Mason, (Cherrytree) Goldstein, Hasson & Lentz.....drilling
McNamee (Bull Valley) Hazen, Harrison & Co.....sand
Hilliard (Clintonville) Hilliard & McKee.. .....drilling
McKinley (Oil City) Braunschweiger & Co .....drilling

SLAB FURNACE, HALL'S RUN, ETC.

McCalmont, Koch Bros..... rig
Grant, Kelley & Smullin..... rig
Phila & Bost, Gates & Doty No 3.....drilling
Zeigler, Wolf & Shafer ..... rig
Rote, Hceter & Co .....drilling
Black heirs (Red Valley) A P Dale..... rig

VICINITY EMLENTON.

Fox, Fox & Morgan (2 old rigs).....
E Crawford, F W Crawford (old rig).....

VICINITY PLEASANTVILLE.

Pithole, Innis, Davis & Lee ..... rig
Blank, Black Bros..... rig
Chandler, J Y Siggins.....drilling
Field, Cornin, Walters & Benedict (old rig)
Lyle, Alex Lowry (old rig) ....

Rigs up and building..... ... 6
Wells drilling..... .8

Total..... 14

Clarion.

Scotch Hill, Kugler & Bartlett (shut down). 500
Barris, Barris & Co... .....sand
Kribbs, Jacob Kribbs & Co..... 500
Fillman, J R Fillman.. .....drilling

CLARION BOROUGH.

Garvin, Cadwallader, form'ly Fuller (old rig)
Maffett, Piper & Brown (old rig).....
Strickler, S Andrews & Co.....sand
D B Curll, Jacob Hahn..... 550
J E Wood, Jacob Hahn..... rig
Sloan, Piper & Brown 550
Arnold, Cadwallader & Co No 4..... 400
P & W R R, Semple & Co..... .. rig
Arnold, C A Leeper & Co.... ... . rig
Johnston, Cadwallader & Co.... .....timbers
Beck, Cadwallader & Co.....timbers

Rigs up and building 3
Wells drilling..... 8

Total..... 11

Butler and Armstrong.

Robert Morrow, Morrow..... .....drilling
Glade Mills, Cappeau & Co....(shut down)
Robinson (Allegheny twp), E Robinson.... 650
Jacob Whitmore, Brown & Co.....rig bldg
W Ellison (Boydstown) McClung & Golden. 1200
Britton & Starr, Britton & Jack ... .1200
T Nolan, Turner & Co..... 500
Burton, Farmers' Oil Co .....drilling
Bracken (Middlesex twp) Bracken & Co .. 1250
Gold, J M Guffey & Co (old rig).....
Logan, J J Leidecker.....1300
Freedly, Philadelphia Company ... .1500
Stovey (Boydstown), Thornburg & Leech ..1300

REIBOLD.

Galebaugh, Leidecker Bros .....sand
Snow, Gantz & Co ....sand
Goehring, Guckert, White & Co.....1200
Miller, Schlegel & Lentz No 3. 1100
" " " No 4..... 700

BRUSH CREEK.

Ulrich, Munhall & Co 1100
Bonner, Murphy Bros (old rig)..... ...
McCullagh, Chambers Oil Co (old rig).....
Duthil, " 600
Swindeman, J A Snee & Co..... 100

SAXONBURG.

Smalley, Root Bros 1500
" Iman & Co.... 600
Helmbold, B B Campbell (old rig).....
Lonitz, Bolard, Greenlee & Co... 100
Seibert, John A Snee & Co No 6..... rig
Crawford, Haymaker & Co No 3..... 400
" " " 4.....rig bldg
Fercht, Lavens, Christie & Co.. .....rig bldg

Rigs up and building..... 4
Wells drilling..... 22

Total..... 26

Washington.

Dr C W Townsend, D C Linn.....drilling
McKeesport, Stone & Co (shut-down).....1800
Bane, Ten-Mile Oil Co (shut-down).....1039
Cameron, Willets & Young No 1..... 625
" " " No. 2 150
" Chartiers Oil Co No 12..... 900
" " No 13..... 700
Fergus, " No 7 ..... .drilling
" " No 8 500
" " No 9 300
" " No 10..... .. . 100
" S P Fergus No 2..... 300
" " No 3. ..... rig
Pease, " No 1..... rig
———, " No 1..... rig
McBurney, Wheeling Oil Co No 2..... 600
" No 3... 300
Davis, Davis Bros.....drilling
Martin, Central Oil Co No 5..... ..... rig
Andrews, Andrews Bros.... ..... rig
Plymire, ——— ..... rig
Fergus heirs, S P Fergus..... rig
Gordon, People's L & H Co No 8..... 2144
Watring, (Buffalo twp) Wheeling Oil Co drilli'g
Munce, I. Willets & Son No 31..... 600
" No 32..... ..... rig
Shirls, H Shirls No 4..... 600
S Weirich, Reed & Co... 850

CANNONSBURG.

A H Giffin, John McKeown No 2.....sand
" " No 3.....1750
Gladden. Cannonsburg Light & Heat Co .sand
McNamara, Fisher, Guffy & Co (old rig)..
Morganza, Flinn, Booth & Magee No 1....sand
" " No 2.....1470
" " No 3.....1200
" " No 4.drilling
Black, I V Hoag..... ... .1300
Douglass, Mfrs Nat Gas Co (old rig) .....
McKeown, " No 2.....1800
McLaughlin, " 900
Smith, " .... rig

TAYLORSTOWN.

Hutchison, Washington Oil Co No 1 (shut down).....2455
J M McMannus, " " " No 2 (shut-down).....2480
Neeley, Washington Oil Co No 1 (shut-down).....
Sam Wright, Washington Oil Co (shut down.....
Jas Hodgens, Washington Oil Co No 2 (shut down).....
Jas Hodgins, Washington Oil Co No 3 (shut down).....
Jas Hodgkins, Washington Oil Co No 4 (shut down).....
Crawford, Palmer & Co (shut down).....
Allison, R H Thayer (old rig).....
Hilton, Ellsworth & Preston No 3..... rig
" " " 4.....rig bldg
Crothers, Caldwell & Co No 3 ..... rig
McCabe, R H Thayer & Co..... 50
Blaney, Donan & Miller..... rig
Crawford, Reighard & Co..... ..... rig

Rigs up and building.... 14
Wells drilling..... 27

Total..... 41

Greene County.

Evans, Mt Morris, E M Hukill No 1 (old rig).1200
D. L. Donelly, Mt Morris, E M Hukill. drilling

GREENSBORO.

Jones, Rubbert & Williams, (old rig)... ...
" C Ohlson.....sand

Rigs..... 0
Drilling..... 3

Total.. 3

BRADFORD AND ALLEGANY.

There is not much to say of the two old fields. Allegany finished a dry hole at a depth of over 3,000 feet, about 4 miles north of Cuba. Its record is valuable geological data. Bradford finished 3 wells, a 6-barrel producer near Duke Centre and a 5-barrel well at Tip-Top. The remaining one is a gasser. Each field has one rig up. Isaac Willetts is moving the tools from his recently completed well at Tip Top to drill the well at Richburg. Armstrong & Co. have a rig up near the Van Scoy mystery on lot 122 and a good bit of quiet agitation reigns in the breasts of people interested in that section.

THE MIDDLE FIELD.

Barnsdall & Co. are the proud owners of the only producing well finished in the middle division during March. It is on warrant 1,464, of the Fox lands, Elk county. Beam & Ralph and Shultz & Co. found gassers down that way in the Kane sand, where they had hoped to get oil in the Bradford sand, and Wynkoop & Co., 'way down by the Clarion line, rung in a duster. Jim Welsh is still playing his venture down by the Clarion river as a mystery and is having a much more lonesome time of it than he had sometimes at Balltown. The natives of Sweden who are drilling on lot 661, Cherry Grove, do not get on very fast, but ought to have the Clarendon sand anyway by the close of another month. Their rate of progress is 900 feet a month.

VENANGO.

The old pioneer county has come into line at last. Whether from a disposition to respect the wishes of the majority or from lack of territory we may not decide, but the indications point to the latter reason. The shallow Pleasantville territory which was humming with industry a couple of months ago is very quiet now. A three barrel well at Pithole is inducement for more drilling there. At Slab Furnace and Hall's Run 6 to 10 barrel rewards keep several sets of tools going.

CLARION.

Old Clarion is active as it well can be. The 40 barrel production of the Kifer well on the town reservoir lot is encouragement to the drillers and everybody possessed of a piece of the territory is utilizing it. After the present batch of wells are in, however, there will be very little territory left that the P. P. A. does not control and drilling may have to cease from sheer necessity. In the town the Rider well on the Greenland lot came in dry, having only 7 feet of inferior sand. It settles the question of drilling among the houses with which the town council wrestled a short time ago. Out on the confines of the Cogley development a couple of new ventures have been started.

BUTLER AND ARMSTRONG.

While the Butler division of the field brings in a great increase in new production it has a decreased list of operations. Its new production account is on an estimated basis, the Haymaker well at Saxonburg being such a rapid changer that no one can profess to be over certain what amount of oil it will produce to-day. It may be estimated a little too high or too low, though perhaps a fair average is struck on its first four days' output. Two other Saxonburg wells rate at 200 barrels each, but these have not stimulated operations, on account of the well-known irregularity of the territory. At Reibold there has been consid-

erable excitement, but no new work, the new work being started last month after the Schlegel excitement.

WASHINGTON.

The Fergus gusher, east of the old field, has brought into life nearly a dozen new wells and rigs. Some of these ought to be very good wells when finished and some of them will probably be sad disappointments to their owners. They are located all around the gusher and will fully test the question of an outlet. At Taylorstown the Jo-Jo Oil Co.'s No. 2, on the Hilton farm, was a much better well than was expected, and it has caused considerable new work to be started in that section to the annoyance of the people who have bowed to the majority will and are now shut-down. The Hilton No. 2 is doing about 280 barrels now and is about ten days old.

GREENE COUNTY.

The Alexander well at Mount Morris is a mystery. Whatever oil it produces is going direct into the Southwest Pennsylvania pipe line's big iron tank and gauges have not been obtained. It is estimated by usually accurate field men, however, at 25 barrels a day, which is probably about right. Mr. Hukill is still drilling on the strength of his faith in that section, and Ohlson is near the sand at Greensboro.

A Primitive Mode of Drilling.

The French Abbe Huc, lately returned from China, thus describes the system of deep earth boring practiced in the district in which he has for some time resided. It has the great merits of extreme simplicity and cheapness. A wooden tube, six feet in length, is driven down through the surface soil. This tube is held at the surface of the ground by a large flag stone, having a hole in the centre to allow the tube to pass through and to project a little above it. A cylindrical mass of iron weighing about 400 pounds, hollow and pointed at its lower end, and having lateral notches or apertures, is jerked up and down in this tube at the end of a lever, from which it is suspended by a rope. This kind of "monkey" disintegrates the rock, the debris of which, converted into sludge by water poured in, finds its way through the lateral apertures into the interior of the cylinder. By raising the latter at intervals, this sludge is removed from the borehole. The rate of boring in rock of ordinary hardness is one foot in twelve hours. Only one man is employed at one time to work the lever. By this means wells of 1,800 feet deep are sunk in about two years by the labor of three men relieving one another every six hours.—*American Inventor.*

The Erie Gas Well.

The Erie *Dispatch* of April 11, says: The sand-reel was being run at the gas well in another attempt to clear the casing for drilling. It's a deep hole, there's a great quantity of water in the well and the job is necessarily a long and laborious one. At the time mentioned the question of whether the leak in the casing had been checked could not be determined with certainty. In any event it will make no difference with final results aside from gaining or losing a little time on the completion of the test as contracted for. These difficulties were all forseen as possible conditions and provisions were made to overcome them. The fact that the strong flows of salt water were encountered at but little over 1,600 feet is taken as a favorable indication. It is the purpose to drill into the Trenton rock which, according to the geological theories, lies in waves——elevations alternating with depressions. These salt water veins were estimated to underlie the surface here at about 1,800 feet, and the fact that they were found some 200 feet higher goes to show, probably, that the test is being made over one of these elevations of the Trenton stratum. If this is the case it will not only save considerable drilling to reach that rock, but it is claimed that the chances of getting gas in large quantity will be much greater on the crest or sides of the "wave" of the stratum than it would be in one of the "troughs" or depressions. Certainly the test will go to the Trenton rock, and the work is merely a question of time.

Runs, Shipments and Stocks.

RUNS OR RECEIPTS

PIPE LINE.	Feb. 1888.	March, 1888.
National Transit	896,260.69	925,107.03
Tidewater	114,017.67	115,615.14
Octave	2,185.66	2,409.47
Pittsburg	49,783.68	55,302.27
Southwest Penn'a	141,760.13	135,656.26
Western & Atlantic	29,567.84	73,134.65
Macksburg	18,860.76	17,283.93
Total	1,252,436.43	1,324,508.75
Daily average	43,187.46	42,726.09

In the above tables only oil received direct from the wells is taken into account.

DELIVERIES OR SHIPMENTS.

PIPE LINE.	Feb. 1888.	March, 1888.
National Transit	1,843,301.07	1,764,167.73
Tidewater	208,575.71	182,219.45
Octave	1,928.97	2,130.48
Pittsburg	49,825.47	57,165.95
Southwest Penn'a	23,394.51	14,419.15
Western & Atlantic	31,170.20	47,066.78
Macksburg	30,045.10	4,121.75
Total	2,188,241.03	2,071,291.29
Daily average	75,491.07	66,815.85

Daily average excess of shipments over runs:

March, 1888	24,089.76
February, 1888	32,303.61
January, 1888	37,753.05
December	43,271.79
November	43,863.54
October	21,078.16
September	10,502.53
August	8,973.79

NET STOCKS.

PIPE LINE.	Feb. 29, 1887.	March 31, 1888.
National Transit	24,204,221.75	23,579,711.45
Tidewater	1,221,105.19	1,188,179.57
Octave	2,721.00	2,530.81
Pittsburg	131,466.80	131,052.97
Southwest Penn'a	372,263.16	293,926.53
Western & Atlantic	33,533.53	59,601.40
Macksburg	369,366.67	382,528.95
Total	26,333,678.10	25,637,531.62

Net stocks decreased:

March, 1888	696,146.48
February, 1888	892,691.77
January, 1888	1,130,703.67
December	1,300,415.55
November	1,249,321.18
October	482,993.39
September	293,299.48
August	284,874.16

	Runs.	*Shipments*
Daily average, March	42,726.09	66,815.85
Daily average, February	43,187.46	75,491.07
Daily average, January	36,700.18	74,453.24
Daily average December	41,917.59	85,188.38
Daily average November	50,160.32	84,023.86
Daily average October	63,486.36	84,564.52

Natural Gas.

The total mileage of pipes in the United States cannot be far from 2,500 miles, not including small pipes for individual use. One-fifth of this quantity of pipe is laid in the city of Pittsburg. The gas wells of Pennsylvania produce from 1,500,000 to 15,000,000 cubic feet a day. High and low pressure wells are also found in Indiana, Illinois, Michigan, Ohio and as far west as Kansas. The total consumption of gas for 1887, as estimated by coal displacement, was equivalent to 10,000,000 tons of coal. The value of this coal was calculated at about $15,000,000. In 1886, the displacement was placed at 6,500,000 tons, nearly all of which occurred in Pennsylvania, about Pittsburg. If the same ratio of increase in displacement could be given 1887, as that of 1886 over 1885, the amount of coal displaced by natural gas in 1887 should be placed at 13,000,000 tons instead of 10,000,000 tons, as stated above, which is a reasonable estimate, as no official or authentic figures are at hand.—*Mining Review.*

Rice Ruled Out.

In the United States Circuit Court at Louisville, April 6, the case of Rice vs. the Louisville & Nashville railroad, involving the question of rate discrimination in favor of the Standard Oil company came up on a demurrer to the bill. Mr. Barnett argued that, even admitting the fact of discrimination, the plaintiff had no remedy at law, as the offense for which it was sought to recover occurred before the passage of the inter-State commerce law, and as the common law did not apply, nor could this court apply any statutory provisions of any of the States to inter-State commerce. Judge Jackson sustained this position and ordered the bill dismissed. Motion for an appeal was at once entered and granted.

Utilizing Lima Fuel.

At Cleveland April 5 an experiment was made at the Lake Erie bolt works with gas made from cheap Lima oil. W. T. Stewart, of Pittsburg, is the patentee of the process used for making gas from super-heated steam and air mixed with gas. F. A. Arter, of Cleveland, who is connected with the Standard Oil company, is also in the enterprise. All of the parties agree that the new gas is a cheap fuel and can be easily applied for illuminating purposes, but just at present they are at work on heating furnaces. It is claimed that the experiment, without burners in the furnace, heavy railway iron was successfully heated to a state fit for the rolls within five minutes.

A Roarer.

There has been a very material extension of the natural gas belt in the northwestern part of the country within the past week. A test well drilled by Hiram Shearer, on his farm in Upper Burrel township, near Chartiers creek, was completed on Wednesday last, at a depth of a little over 1,500 feet. It proved to be a gusher. The pressure is 440 pounds. The hoarse roaring of the escaping gas can be heard for a distance of several miles. This new well is located seven miles northwest of the Pine Run developments, and opens an immense scope of entirely new territory.—*Westmoreland Democrat.*

Gas Company Election.

At the annual meeting of the Natural Gas company of West Virginia the following officers were elected: Directors, J. J. Vandergrift, John Pitcarn, Jr., C. W. Batchelor, J. G. Hoffman, Sr., A. J. Sweeney, Thomas O'Brien, J. W. Craig, J. J. Buchanan, B. W. Vandergrift, Henry Fisher. Officers, C. W. Batchelor, President; Henry Fisher, Treasurer; George Heard, General Manager and Assistant Treasurer; Harris Buchanan, Secretary.

Action of the Well Drillers.

On account of the uncertain and low price of crude during the first of the present month it was deemed inexpedient to sell any portion of the oil set aside for the payment of the idle well drillers. Accordingly, at a meeting of the Bradford Assembly, the following articles were adopted:

At a regular meeting of the Bradford lodge of the Well Drillers' Union it was decided that, in consequence of the low price of oil, it would be unwise and inexpedient to sacrifice future prospects to present necessity: and therefore it was agreed to waive monthly payments until such time as the price of oil may justify the resumption of same.

The above was concurred in with a unity of feeling that surprised the most sanguine member of the Well Drillers' Union, showing their determination to fulfill their part of the contract.

T. B. HUMES,
T. M. GRIFFITH,
B. MCKINNEY,
Committee.

BRADFORD, Pa., April 11, 1888.

Many of the assemblies throughout the region passed resolutions of a similar nature, but a dispatch sent out from Washington, Pa., contains the following: It will be seen that final action will be taken to-day when other counsels may prevail: A meeting of the Well Drillers and Tool Dressers' Union was held at this place Thursday afternoon, April 12. It was addressed by Hon. David Kirk and N. F. Clark, prominent parties in the shut-down movement. The meeting was held with closed doors and lasted all the afternoon. The presence of the two gentlemen was for the purpose of procuring the passage of a resolution which the speakers claimed had received the assent of all the upper country lodges viz.: To wait for the payment of the $1 a day promised them by the Producer's Protective association until the 15th of May, when the Producers' Protective association expected to obtain a better price for their oil. The resolution was not passed and another meeting was held Saturday afternoon of the same week. The pay of the men is in arrears for the month of March, and some of them despair of ever getting it. Some of the members state that many have already returned to work and that others will do so shortly. They complain that they have not been treated fairly in the matter. At the meeting on Saturday the final action was deferred until the next regular meeting. In spite of all rumors the Assembly realizes that the proper course has been taken and the Washington Assembly will come into line and await for future developments.

Oil a Big Thing.

Right here in Pennsylvania, the head and heart of the oleaginous business, many people have no idea of the magnitude of the petroleum developments. They have heard queer stories of reverses of fortune in the oil regions, used kerosene for illuminating purposes, read something about the Standard Trnst, and wondered what on earth anybody could find interesting in the greasian subject. Look at these statistics of the industry, compiled recently by competent authorities: It has cost $50,000,000 to pay storage and carrying charges on oil stocks since 1881. $70,000,000 have been lost by oil speculators during the same period. One broker said his consumers had lost $4,000,000 in 1882 and $1,000;000 in 1883. It has taken about $21,500,000 to pay brokers' commissions since 1881, making a total of $147,800,000, which loss has been carried by speculators in seven years. Since 1859 there have been drilled about 57,900 wells at a total cost of $200,000,000. These wells have produced 350,000,000 barrels of oil, which has been sold for $375,000,000, leaving a profit of $175,000,000.

These are pretty respectable figures, yet they convey but a poor idea of the importance of the petroleum industry in this Commonwealth. The oil produced in the northwestern part of Pennsylvania finds its way to the remotest corners of Europe, Asia and Africa. It lights the hut of the Tartar, the tent of the wild Arab, the hovel of the Bushman, the craal of the Caffir. Nothing in the world is more cosmopolitan than the great illuminator of the century, which armies of men are employed in producing, refining and transporting. No mistake about it, oil is a big thing.—*McLauren in Harrisburg Telegram.*

Dr. Pohlman's Theory.

In Buffalo last Friday evening, in his paper on The Geology of Natural Gas, Dr. Pohlman reviewed the theories of those persons who believe that natural gas may have its origin in decompositions recompositions of water and carbonic acid and that its manufacture may thus go on indefinitely. He thought, however, the chemical theory, and with it the notion of an inexhaustible supply, would have to be abandoned, and quoted as the best authority on the subject Prof. Leslie, State geologist of Pennsylvania, who calls the amazing exhibition of oil and gas during the last twenty years "a temporary and vanishing phenomenon—one which our young men will live to see come to its natural end." He says he is no geologist if the manufacture of oil in the laboratory of nature is going on at the thousandth part of the rate of its exhaustion, while the end of the gas snpply will come sooner than that of the oil. Prof. Carll, a geologist on the staff of the Pennsylvania survey, was quoted to the effect that the deposits around Pittsburg were capable, no doubt, of supplying a reasonable number of wells many years, but that they would soon become exhausted if too copiously drawn upon, as they were likely to be as a matter of speculation by persons who leased land and drilled wells merely for the purpose of making sales.

Independent Refiners and Pipe Lines.

The Independent Refiners' association of Titusville have asked Congress to make the provisions of the inter-State commerce law apply to pipe lines which carry petroleum. If there are any inter-State pipe lines that are chartered and have thus become common carriers there could be no objection to this course, while some public benefit might result. The worst trouble with the pipe lines so far, however, has been with those that did business exclusively within the State. The inter-State commerce law would be powerless to prevent the evils of discrimination and excessive charges upon the lines doing business entirely within a State. Unless the oil men can get State Legislatures to help them in this matter all that Congress may do, if it does all it can, will be of little value to either refiners or producers.—*Philadelphia Times.*

Stray Notes.

The Pennsylvania Gas company will lay an additional eight-inch main from the wells to Erie this season.

Eight wells with 14 barrels production belonging to Judd & Geister, located on the Kaufman farm, Cranberry township, Venango county, were sold recently for $8,500.

The wells on the Giffin farm, that have been put down by John McKeown, have shown nothing in any of the sands, neither gas nor oil.

Arrangements are being made to drill for gas on the Clayton farm, near Geneva station, on the Ft. Wayne railroad, in Beaver county. It is thought that an arm of the Sheffield district will be found there.

A well drilled on the Blank farm, near Haworth's mills, Pithole district, is pumping 20 barrels a day. The oil is very dead and is pronounced to be "flood oil," with the water not far behind it.

Matthew Addy & Co., of Cincinnati, O., who are erecting an immense plant at Addyson—about ten miles west of Cincinnati—for the manufacture of cast iron pipe, have ordered several Loomis producers for making fuel gas.

Negotiations for a consolidation of the Wheeling Natural Gas company and the West Virginia Gas company have ceased for a time at least. No agreement could be reached in regard to which set of officers should conduct the combined companies.

The Burgettstown Oil and Gas company's test well has reached the depth of 3,000 feet, and operations have ceased. A small amount of oil and gas has been found, but not in paying quantities. This is the third test well drilled there in the last two years.

By the development of natural gas Kokomo in one year's time has secured ten factories with an aggregate capital of $600,000, producing in products nearly $1,000,000 yearly, employing 900 hands, with a weekly pay-roll of $10,000. Furthermore, she has secured an investment of half a million dollars in reality, has built 500 new residences and business houses, and has increased her population 2,000.

An Encouraging Outlook.

The excess of deliveries over runs per day thus far this month has averaged 30,704 barrels, which indicates a reduction of the stocks during April of more than 900,000 barrels. To this factor must be added the decrease of operations in Saxonburg and the possibility that restriction will yet be carried to other productive fields. A few facts like these demonstrate why the back bone of the shut-down grows stronger as the months roll by. It has its second wind and winks knowingly when people ask how long it is going to last.

THE sad case of John Summers, who was recently taken to the Warren State Hospital, is a living example of what the mad whirl of excitement around the bull ring of an Oil Exchange will do. He was well known in Pittsburg and Oil City as an extensive oil broker and as the first operator in the Pithole field. He is the picture of his former self, but with his active and energetic brain silent.

Stocks Abroad.

Reports of stocks in London and the seven principal Continental ports are summarized in the following statement:

Stocks Afloat and Ashore.	*March 24, 1888* *Barrels.*	*Feb. 25, 1888..* *Barrels.*
Seven Continental ports	558,253	521,111
London and English ports	119,573	110,653
Total stocks afloat and ashore	677,826	631,764
Increase in stocks since February 25	46,062	

A detailed statistical table giving the stocks on hand, the stocks in vessels on the ocean, and the amount unloading from the vessels at the different ports is appended, which shows at a glance the condition of affairs abroad and the increase or decrease as compared with the corresponding period of 1887. The shipments represent the amount of oil going to the interior of Europe from the seaports:

STOCKS IN FOREIGN PORTS MARCH 24, 1888.

Ports.	*Stocks March 24.*		*Stocks afloat March 24.*		*Loading March 24.*		*Grand total stocks afloat and loading.*		*Receipts from July 1.*		*Shipments from July 1.*	
	1887 *Barrels.*	1888 *Barrels.*	1887 *Barrels.*	1888 *Barrels.*	1887 *Barrels.*	1888 *Barrels.*	1887 *Barrels.*	1888 *Barrels.*	1886 *Barrels.*	1887 *Barrels.*	1886 *Barrels.*	1887 *Barrels.*
Bremen	66,545	40,078	50,421	11,571	13,600	20,000	130,566	71,649	544,359	636,290	689,196	746,598
Hamburg	33,540	35,472	60,243	126,643	21,100	29,200	114,883	191,315	710,011	808,991	831,336	889,600
Antwerp	41,960	72,079	35,131	49,415	36,500	34,000	113,591	155,494	680,437	696,572	799,478	728,175
Rotterdam	4,424	1,781	43,689	14,743	33,800	34,000	81,913	50,524	390,144	380,800	467,659	428,902
Amsterdam	9,415	7,531	29,480	44,710	.....	.....	38,895	52,241	187,149	188,333	245,212	212,040
Stettin	4,670	7,873	20,229	21,802	4,200	4,000	29,099	33,675	283,450	268,853	294,673	297,591
Danzig	15,571	218	.....	3,137	.....	.....	15,571	3,355	54,945	41,741	68,811	67,568
Total	176,125	165,032	239,193	272,021	109,200	121,200	524,518	558,253	2,850,495	3,021,580	3,396,359	3,370,474
London	87,504	78,153	70,564	.....	.....	...	158,068	110,653	596,151	.....	604,551	..

	1885	1886	1887	1888
Total stocks Continental ports	553,333	229,251	176,125	165,032
Total afloat " "	223,682	339,639	239,193	272,021
Total loading	154,600	130,300	109,200	121,200
Total	931,615	699,190	524,518	558,253
Afloat and loading for direct Continental ports	10,600	14,200	32,400	.....
" " " Baltic Sea, exclusive Stettin and Danzig	15,750	18,600	18,300	.....
Total Afloat and loading for Continental ports	957,965	731,990	575,218	.....
" " " " " London	104,839	118,173	158,068	.....
" " " " " English harbors, exclusive London	26,800	22,200	58,400	.....
Grand total	1,089,604	872,363	791,686	.....

OFFICIAL STATEMENT—EXPORTS OF PETROLEUM, MARCH, 1888.

BY WM. F. SWITZLER, CHIEF OF THE BUREAU OF STATISTICS, WASHINGTON, D. C., APRIL 10, 1888.

Customs Districts.	*Mineral Crude.*		*Napthas.*		*Illuminating.*		*Lubricating and Parafine Oils.*		*Residuum.*		*Total.*	
	Gallons.	*Dollars.*	*Gallons.*	*Dollars.*	*Gallons.*	*Dollars.*	*Gallons.*	*Dollars.*	*Gallons.*	*Dollars.*	*Gallons.*	*Dollars.*
Boston & Charlestown, Mass.	.....	.....	.....	.....	119,435	12,189	31,506	5,993	.....	.....	150,941	18,182
New York, N. Y.	2,343,176	177,953	292,517	24,188	28,460,969	2,398,601	1,833,767	321,578	1,680	137	32,932,109	2,922,457
Philadelphia, Pa.	3,029,892	202,258	390,440	28,384	10,682,708	930,288	83,053	5,055	.....	.....	14,186,093	1,165,985
Baltimore, Md.	.....	.....	.....	.....	25,220	3,415	.....	.....	.....	.....	25,220	3,415
Total March, 1888	5,373,068	380,211	682,957	52,572	39,288,332	3,344,493	1,948,326	332,626	1,680	137	47,294,363	4,110,039
Total March, 1887	4,425,609	295,708	485,096	46,263	35,491,793	2,783,216	2,260,483	389,139	446,124	20,616	43,109,105	3,534,942
Total 9 months ending M'ch 31, '88	69,754,966	4,719,142	9,474,699	779,217	339,257,098	26,286,838	16,990,722	2,854,769	936,516	48,470	436,414,001	34,688,436
Total 9 months ending Mc'h 31, '87	60,115,810	3,849,886	12,699,566	1,116,507	342,180,234	26,625,985	12,659,222	2,321,036	1,983,400	97,590	429,638,232	34,011,004

CRUDE QUOTATIONS FOR MARCH, 1888.

Day of Month and Week.	Bradford.				Oil City.				New York.				Pittsburg.			
	Opened	*Highest*	*Lowest*	*Closed*	*Opened*	*Highest*	*Lowest*	*Closed*	*Opened*	*Highest*	*Lowest*	*Closed*	*Opened*	*Highest*	*Lowest*	*Closed*
1—Thursday	94¼	94½	93⅝	94⅛	94⅛	94⅜	93⅝	94⅛	94	94¼	93⅝	94¼	94⅜	94½	93⅝	94⅛
2—Friday	93	93¾	92	93	93½	93¾	92⅞	93	93¾	93¾	92¼	93⅛	93½	93¾	92⅞	93⅛
3—Saturday	93	94	92¾	93⅝	92¾	94	92¾	93⅝	92¾	94⅛	92½	93⅝	93¾	94	92¾	93⅝
5—Monday	93½	93⅞	93⅜	93¾	93⅞	93⅞	93⅜	93⅝	93⅞	94	93⅜	93¾	93¾	93⅞	93⅜	93⅝
6—Tuesday	93¾	1 00	93⅛	98½	93¾	1 01	93⅝	98½	93¾	1 00	93⅝	98¾	93¾	1 00	93⅝	98½
7—Wednesday	99½	99½	97	97¾	1 00	1 00½	96⅞	97¼	1 00	1 00	96⅞	97⅜	1 00	1 00½	96⅞	97¼
8—Thursday	96¼	96⅜	94¾	95¼	96	96¼	94¾	95⅜	96	96⅜	94⅝	95⅜	96	96¼	84¾	95⅜
9—Friday	95	95⅝	94¾	95	95	95⅝	94½	95	94⅞	95⅞	94⅝	94⅞	95	95¾	94½	95
10—Saturday	95	96¼	95	96⅛	95	96⅛	95	96⅛	95¼	96⅛	94¾	96⅛	95	96⅛	95	96⅛
12—Monday	95¼	95⅞	95	95⅞	94½	96	94⅜	96	95	96	94	95⅞	94½	96	94⅜	96
13—Tuesday	95½	97¾	95¼	97½	95	97¾	95	97⅜	96	97¼	96	97¼	95	97¾	95	97⅜
14—Wednesday	97⅜	98⅛	96¼	96⅜	97½	98⅛	96⅛	96⅜	97¼	98¾	96⅝	96¾	97⅜	98⅛	96⅛	96½
15—Thursday	96¾	97⅝	96½	97⅝	96¾	97¾	96⅜	97⅝	96⅞	97¾	96½	97½	96¾	97⅝	96½	97⅝
16—Friday	97⅜	98	97	97⅜	97⅜	95	96⅞	97¼	97⅜	97⅞	96⅞	97½	97⅜	98	96⅞	97⅜
17—Saturday	97⅜	97¾	97⅛	99¼	97½	97¾	97	97¼	97⅜	97¾	97⅛	97¼	97⅜	97¾	97	97¼
19—Monday	96¾	97⅜	95⅝	96¼	97	97½	95½	96¼	97	97½	95⅝	96⅜	97	97½	95½	96¼
20—Tuesday	96⅜	96⅜	95	95¾	96	96¼	95	95¾	96¼	96⅜	95	95⅞	96	96¼	94⅞	95¾
21—Wednesday	95¾	96	93⅞	93⅞	95⅝	96	93⅞	93⅞	95⅞	96	93⅞	93⅞	95⅝	96	93⅞	93⅞
22—Thursday	93⅝	93⅝	91¾	93⅝	93½	93½	91¼	93½	93½	93⅝	91¾	93⅝	93½	93½	91¼	93½
23—Friday	93⅝	93⅝	88¼	88¼	93¼	93½	88⅜	88⅜	93⅛	93¼	88¼	88⅜	93⅛	93¼	88⅜	88½
24—Saturday	89	90⅜	87⅞	90¼	89⅜	90⅜	88¼	90¼	89	90½	88⅛	90½	89	90⅜	88¼	90¼
26—Monday	90⅛	91	89½	90⅝	90⅜	91	89½	90⅝	90¼	91⅛	89⅜	90¾	90⅜	91	89½	90¾
27—Tuesday	90¾	91¾	90⅛	90⅝	90⅞	91¾	90	90	90⅞	91¾	90	90⅛	91	91⅞	90	90
28—Wednesday	90	90	85	85⅛	89¾	90	85	85¼	89⅝	90	84⅞	85⅜	89¾	90	85	85¼
29—Thursday	85½	87⅞	85½	87⅝	85	87⅞	85	87⅝	85¼	87⅞	85	87⅝	85	87⅞	85	87¾
30—Friday	Holiday.															
31—Saturday	88¼	88¼	83¼	84⅞	87⅝	87⅝	83¼	84⅞	88	88	83⅛	85	87½	87⅝	83¼	84⅞

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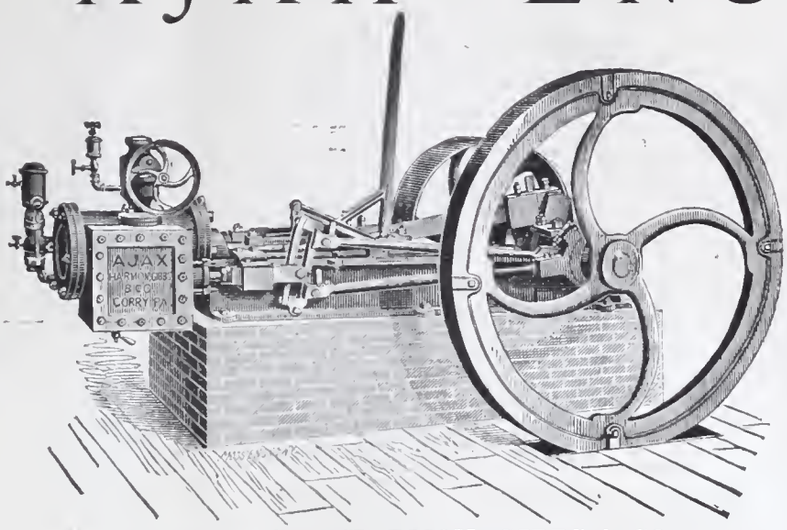

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NORTHERN DIVISION.

SOUTHBOUND TRAINS.

STATIONS.	No. 7.	No. 23.	No. 25.	No. 17.	No. 19.
	A M	A M	A M	A M	P M
Bradford Lv	.....	.....	.....	7 30	.....
Mt. Jewett	.....	.....	.....	9 15	.....
Kane	.....	.....	.....	10 10	.....
Sheffield Junc	.....	.....	.....	11 04	.....
				P M	
Marienville	.....	.....	.....	12 12	.....
Tylersburg	.....	.....	.....	12 55	.....
Clarion Junction	.....	.....	6 20	1 45	4 00
Clarion	.....	.....	5 50	12 35	3 30
Shippenville	.....	.....	6 30	1 58	4 14
Knox	.....	.....	6 45	2 14	4 33
St. Petersburg	.....	.....	7 24	3 04	5 20
Foxburg	.....	5 40	7 38	3 25	5 40
Parker	.....	5 50	7 48	3 36	.....
Bruin	.....	6 08	8 06	3 59	.....
Petrolia	.....	6 18	8 17	4 10	—
Karns	.....	6 22	8 22	4 17	9
Millerstown	.....	6 36	8 36	4 32	
St. Joe	.....	6 50	8 50	4 45	P M
Butler	5 15	7 18	9 30	5 20	1 50
Renfrew	5 28	7 39	9 46	5 38	2 13
Callery Junction	5 50	8 05	10 10	6 00	2 35
Allegheny....Ar	7 10	9 33	11 25	7 23	4 00

NORTHBOUND TRAINS.

STATIONS.	No. 34.	No. 8.	No. 18.	No. 24.	No. 26.
	P M	A M	A M	P M	P M
Allegheny ... Lv	5 40	9 20	7 20	1 40	4 40
Callery Junction	7 30	10 50	8 40	3 00	6 10
Renfrew	8 02	11 12	9 00	3 21	6 33
Butler	8 30	11 30	9 21	3 50	7 05
St. Joe	.....	.....	9 50	4 15	7 38
Millerstown	.....	.....	10 06	4 32	7 53
Karns	.....	—	10 20	4 45	8 06
Petrolia	.....	20	10 24	4 50	8 10
Bruin	.....	—	10 35	5 00	8 22
Parker	.....	A M	10 52	5 18	8 39
Foxburg	.....	6 27	11 25	5 45	8 50
St. Petersburg	.....	6 44	11 41	6 00	.....
			P M		
Knox	.....	7 49	12 32	6 45	.....
Shippenville	.....	8 11	12 53	7 02	.....
Clarion Junction	.....	8 30	1 14	7 15	.....
Clarion	.....	9 00	2 15	7 45	.....
Tylersburg	.....	.....	1 48	.....	.....
Marienville	.....	.....	2 26	.....	.....
Sheffield Junc	.....	.....	3 06	.....	.....
Kane.....Ar	.....	.....	3 58	.....	.....
Mt. Jewett	.....	.....	4 40	.....	.....
Bradford	.....	.....	6 35	.....	.....

No. 4 leaves Allegheny at 6 a m; Callery Junction, 7:30; Renfrew, 7:15; arrives at Butler 8:10 a m.

No. 29 leaves Butler 11:45 a m; Renfrew, 12:06; arrives at Callery Junction 12:25; Allegany, 1:55 p m.

Westbound train leaves Callery Junction as follows:

Cleveland and Toledo express 8:35 a m; New Castle accommodation 3:05 p m; Chicago express, with through sleeping car, 1:44 p m; Zelienople accommodation 6:10 p m.

Sunday trains, Nos 23, 26 and 29, run daily. On Sundays No. 24 will run 25 minutes late and connect at Callery Junction for New Castle. No. 29 one hour late and connect at Callery Junction with Chicago express.

Nos. 7 and 17 will run daily between Butler and Allegheny.

No. 50, Sundays only. Leaves Allegheny at 12:40 p m; Callery Junction, 1;50 p m; arrives at Renfrew 2:14; Butler, 2:35.

C. W. BASSETT,
General Passenger Agent.

Dunkirk, Allegheny Valley & Pittsburg.

Going North.	No. 2.	No. 4.	No. 6.
	A M	P M	A M
Titusville Lv	7 35	3 20	7 35
Grand Valley ..... "	8 03	3 48	8 01
Irvineton ..... "	8 45	4 36	8 44
Warren ..... "	8 58	4 53	8 56
Junction ..... "	9 55	5 45	9 48
Lilly Dale ..... "	10 50	6 36	10 37
Dunkirk .....Ar	11 25	7 10	11 12

Going South.	No. 1.	No. 3.	No. 5.
	A M	P M	P M
Dunkirk Lv	9 25	4 00	2 40
Lilly Dale ..... "	10 03	4 38	3 14
Junction ..... "	11 02	5 45	4 08
Warren ..... "	11 55	6 44	5 06
	P M		
Irvineton ..... "	12 10	7 00	5 22
Grand Valley ..... "	12 58	7 49	6 12
Titusville .....Ar	1 20	8 15	6 40

Bradford, Bordell & Kinzua R. R

—AND—

Bradford, Eldred & Cuba R. R.

In effect Jan. 30, 1888.

Westward.					Eastward.		
.....	p m	a m	Ar	Lv	a m	p m	.....
.....	5 15	11 50	....Bradford..		7 25	2 25	.....
.....	4 40	11 15	Kinzua Junct n		8 05	3 05	.....
.....	4 33	11 08	....Rew City....		8 13	3 12	.....
.....	4 13	10 48	.....Rixford....		8 31	3 28	.....
a m	4 08	10 43	..Duke Centre..		8 36	3 33	a m
10 10	3 50	10 25	.....Eldred.....		8 55	3 50	1 25
9 45	3 32	10 10	..Bullis Mills.		9 10	4 05	1 45
9 26	3 17	9 54	.....Ceres.....		9 26	4 21	2 10
8 55	3 04	9 40	.Little Genesee.		9 40	4 35	2 35
8 40	2 55	9 30	....Bolivar.....		9 50	4 45	2 55
7 50	2 28	9 03	...Allentown....		10 15	5 12	3 35
7 00	1 55	8 30	lv. Wellsville. ar		10 50	5 45	4 15
a m	p m	a m			a m	p m	p m
	29	3	N. Y. L. E. & W.		8	22	
.....	10 45	2 37	..Hornellsville..		12 12	8 35	.....
.....	8 48	11 58	.... .Elmira.....		1 50	10 10	.....
.....	6 55	11 28	..Binghamton..		3 33	12 44	.....
				Lv Ar			
.....	11 30	5 00	...New York...		10 37	7 57	.....
	p m	p m			p m	a m	
p m	p m	a m			a m		p m
7 40	.....	10 35	ar ..Bradford. lv		8 20	.....	5 25
7 05	.....	10 00	Kinzua Junct'n		9 00	.....	6 05
6 59	10 02	9 54	.....Aiken.....		9 06	.....	6 11
6 53	.....	9 48	.....Davis.....		9 12	9 23	6 17
6 47	9 50	9 42	.....Simpson....		9 18	.....	6 23
6 35	.....	9 30	.....Ormsby....		9 30	.....	6 35
6 00	9 05	8 55	..Smethport...		10 05	10 15	7 10
6 00	.....	8 55	...Mt. Jewett...		10 05	.....	7 10
5 15	.....	8 10	... ..Kane ...ar		10 50	.....	7 55
p m	a m	a m			a m		

PITTSBURG & WESTERN.

1 04	.....	.....	.....Clarion.....		1 40	.....	.....
12 32	.....	.....	....Foxburg		3 25	.....	.....
10 50	.....	.....	.....Parker.....		3 36	.....	.....
.....	.....	.....	.....Petrolia....		3 45	.....	.....
9 21	.....	.....	.... Butler.....		5 20	.....	.....
				Lv Ar			
7 20	a m	.....	... Allegheny...		7 20	p m	.....

No Sunday Trains.

JNO. C. McKENNA,
Supt. and Gen. Pass. Agt.

PHILADELPHIA & ERIE RAILROAD.

Time table in effect Nov. 15, 1886. Eastern standard time.

Eastward.	No. 18.	No. 8.	No. 4.	No. 12.
	A M	A M	P M	P M
Erie Lv	7 35	.....	2 45	5 25
Corry ..... "	9 00	.....	4 13	6 55
Irvineton ..... "	9 50	.....	5 00	7 50
Warren ..... "	10 05	.....	5 15	8 05
Kane .....Ar	11 25	.....	6 30	9 15
Kane Lv	.....	6 25	6 55	.....
Johnsonburg ..... "	.....	6 58	7 30	.....
Emporium Junction.. "	.....	8 30	9 15	.....
Lock Haven ..... "	.....	11 15	11 58	.....
		P M	A M	
Williamsport ..... "	.....	12 20	1 25	.....
Harrisburg .....Ar	.....	3 13	4 30	.....
Philadelphia ..... "	.....	6 50	8 25	.....

Westward.	No. 11.	No. 3.	No. 11.	No, 17.
	A M	P M	A M	P M
Philadelphia Lv	.....	11 25	7 40	.....
		A M		
Harrisburg ..... "	....	3 30	11 25	.....
			P M	
Williamsport ..... "	.....	7 10	2 25	.....
Lock Haven ..... "	.....	7 58	3 15	.....
Emporium Junction.. "	.....	10 30	6 25	.....
Johnsonburg ..... "	.....	12 00	8 02	.....
		P M		
Kane .....Ar	.....	12 40	8 35	.....
Kane Lv	6 35	1 00	.....	4 10
Warren ..... "	7 45	1 58	.....	5 25
Irvineton ..... "	7 58	2 09	.....	5 46
Corry ..... "	8 55	2 56	.....	6 45
Erie .....Ar	10 10	4 00	.....	8 05

Trains daily except Sunday.

Through-car arrangement westward—Erie mail—Pullman palace sleeping cars Philadelphia to Erie, and Philadelphia to Williamsport (cars open to receive passengers at Philadelphia at 10 p m), and Washington to Williamsport. Passenger coaches from Philadelphia to Erie, and Baltimore to Williamsport.

Niagara express—Pullman parlor car Philadelphia to Williamsport.

Through-car arrangement eastward—day express—Pullman parlor car Williamsport to Philadelphia. Passenger coaches Kane to Philadelphia, and from Williamsport to Baltimore.

Erie mail—Pullman sleeper Erie to Philadelphia, and Williamsport to Philadelphia (car open to receive passengers at Williamsport at 9 p m). Passenger coaches Erie to Philadelphia, and Williamsport to Baltimore. Sleeping car Williamsport to Washington.

WHEELING & LAKE ERIE RAILROAD.

Time table in effect Jan. 1888. Central standard time.

Eastward.	No. 5..	No. 7.	No. 9.*	No. 1.*
	A M	P M	P M	A M
Toledo Lv	7 45	1 10	4 50	.....
Oak Harbor ..... Ar	8 41	2 05	5 45	.....
Fremont	9 06	2 30	6 10	.....
Clyde	9 22	2 47	6 25	.....
Bellevue	9 37	3 03	6 40	.....
Monroeville Lv	9 55	3 20	6 58	3 10
Norwalk	10 10	3 38	7 15	3 22
Wellington	11 00	4 32	8 08	4 00
Creston	11 53	5 20	9 05	4 47
	P M			
Orrville .....Ar	12 20	5 48	9 40	*5 15
			A M	
Orrville Lv	12 40	5 53	7 05	7 05
Massillon ..... Ar	1 20	6 35	7 52	7 52
Massillon Lv	1 20	6 35	7 52	7 52
Navarre	1 35	6 50	8 10	8 10
Valley Junction....Lv	2 15	7 40	8 55	8 55
New Cumberland	2 28	7 53	9 10	9 10
Sherrodsville	2 40	8 05	9 25	9 25
Leeesville	2 48	8 13	9 40	9 40
Bowerston.....Ar	2 55	8 20	9 50	9 50
Canal Dover	2 57	6 05	.....	.....
		A M	.....	.....
New Comerstown	3 38	6 45	.....	.....
Cambridge	4 38	7 45	.....	.....
Macksburg	6 09	9 15	.....	.....
Marietta.....Ar	7 25	10 25	.....	.....

Westward.	No. 5.	No. 8.	No. 4	No. 2.
	A M	P M	A M	
Marrietta Lv	6 00	12 10	.....	.....
Macksburg	7 15	1 24	.....	.....
Cambridge	8 57	3 00	.....	.....
New Comerstown	10 00	4 00	.....	.....
Canal Dover	10 42	4 40	.....	.....
Bowerston	11 25	3 45	5 55	.....
Leesville	11 32	3 55	6 02	.....
Sherrodsville	11 40	4 10	6 10	.....
New Cumberland	11 52	4 25	6 22	.....
	P M			
Valley Junction	12 20	5 02	6 45	.....
Navarre	12 50	5 35	7 35	.....
Massillon	1 05	5 50	8 00	.....
Orrville ..... Ar	1 40	6 25	8 55	.....
Orrville Lv	1 45	*6 35	9 13	.....
Creston	2 18	7 02	9 42	.....
Wellington	3 05	7 43	10 33	A M
Norwalk	3 55	8 25	11 25	7 25
Monroeville	4 07	8 35	11 37	7 35
Bellevue	4 23	9 15	11 55	7 51
			P M	
Clyde	4 39	9 29	12 10	8 06
Fremont	4 55	9 45	12 28	8 23
Oak Harbor	5 20	.....	12 53	8 45
Toledo.....Ar	6 20	*10 45	1 50	9 40

HURON DIVISION.

Northward.	No. 25.	No. 27.		
	A M	P M		
Monroeville Lv	.....	.....	.....	.....
Norwalk ..... Ar	.....	.....	.....	.....
Norwalk Lv	7 00	3 55	.....	.....
Milan .....Ar	7 25	4 20	.....	.....
Friese Landing	7 37	4 32	.....	.....
Huron	7 55	4 50	.....	.....

Southward.	No. 26.	No. 28.		
	A M	P M		
Huron Lv	9 10	5 30	.....	.....
Friese Landing	9 25	5 45	.....	.....
Milan	9 45	6 03	.....	.....
Norwalk ..... Ar	10 20	6 30	.....	.....
Norwalk Lv	.....	.....	.....	.....
Monroeville .....Ar	.....	.....	.....	.....

*Daily.

This road is now open through from Toledo to Bowerston, connecting with the Pennsylvania system for all points east.

Through-Car Service—Between Toledo, Cambridge and Marietta; between Toledo and Bowerston; between Toledo and Akron, Youngstown and Pittsburg; between Chicago, Akron, Youngstown and Pittsburg.

JAMES M. HALL,
Gen'l Pass. Ag't.

M. D. WOODFORD,
General Manager.

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St. James Place, Bradford, Pa.

W. & W. R. R. Time Table.

NORTHW'D. 3	NORTHW'D. 1		STATIONS.		SOUTHW'D. 2	SOUTHW'D. 4
2 00	6 00	Lv	Waynesburg	Ar	10 35	6 25
2 15	6 15		Sycamore		10 17	6 07
2 23	6 23		Swart		10 09	5 59
2 30	6 30		Deer Lick		10 02	5 52
2 38	6 38		West Union		9 53	5 43
2 47	6 47		Dunn		9 43	5 33
2 50	6 50		Lindley's Mills		9 40	5 30
3 01	7 02		West Amity		9 28	5 18
3 05	7 08		Luellen		9 22	5 12
3 11	7 13		Baker		9 17	5 07
3 14	7 20		McCracken		9 13	5 00
3 27	7 35		Vankirk		9 00	4 47
3 40	7 50		Braddock		8 48	4 33
3 55	8 05	Ar	Washington	Lv	8 35	4 20
6 36	9 55	Ar	Pittsburg	Lv	6 10	1 55

P. C. & St. L. R. R.

Time given above is Central Standard, which is 40 minutes slower than Pittsburg or local time, or one hour slower than Eastern time.

The Company reserve the right to vary from this schedule as circumstances may require. All trains daily except Sunday.

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For tickets, time tables and full information call on D. Lundergan, agent, B., R. & P. depot.

Time table in effect April 1, 1888.

Eastward. 12 Buff Mail	Eastward. 10 Buff Ex.		STATIONS Buffalo Division.		Westward. 9 Br'd Ex.	Westward. 11 Br'd Mail
p m	a m				a m	p m
3 30	7 45	Lv	Bradford	Ar	11 15	8 05
3 33	7 48		Kendall		11 12	8 02
3 41	7 56		Limestone		11 04	7 54
3 53	8 08		Carrollton		10 52	7 42
4 08	8 25		Salamanca		10 40	7 31
4 31	8 46		Ellicottville		10 14	7 04
4 40	8 55		Ashford		10 05	6 55
5 15	9 30		Springville		9 30	6 20
6 35	10 50	Ar	Buffalo	Lv	8 10	5 00
p m	a m				a m	p m

Rochester Div.

40	2 Ex.	4 Rch Mail		STATIONS.		1 Mail	3+ Ex.	41
a m	a m	p m				p m	p m	p m
7 15	9 00	2 30	Lv	Bradford	Ar	1 10	10 25	5 30
7 56	9 11	2 42		Limestone		12 55	10 14	5 05
8 08	9 24	2 54		Carrollton		12 41	10 02	4 55
....	9 50	3 16		Salamanca		12 28	9 49	....
11 57	10 13	3 40		Ellicottville		11 57	9 23	1 15
....	11 41	5 11		Gainesville		10 25	8 00	....
....	12 03	5 36		Warsaw		10 02	7 35	....
....	12 53	6 20		LeRoy		9 22	6 40	....
....	1 45	7 15	Ar	Rochester	Lv	8 30	5 40	....
....	p m	p m				a m	p m	p m

Pittsburg Division.

45	1 Mail		STATIONS.		4 Mail	44
a m	p m				p m	p m
6 27	1 30	Lv	Bradford	Ar	2 15	4 40
12 20	4 00		Ridgeway		11 38	11 10
3 50	5 25		Falls Creek		10 10	7 00
4 00	5 30		Du Bois		10 00	6 15
....	6 20	Ar	Punxsutawney	Lv	9 00	
p m	p m				a m	a m

Connections for East and West are made at Rochester with New York Central & West Shore R. R., and at Salamanca with the N. Y., P. & O. R. R. for Jamestown, Mansfield, Cincinnati, Chicago and the West, at Ridgway with the Philadelphia & Erie R. R. for Emporium, Williamsport, Philadelphia and Baltimore, at Falls Creek with the Allegheny Valley Railroad for Brookville, Reynoldsville and Stations on the Low Grade Division.

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G. W. BARTLETT, Gen. Supt., Buffalo, N. Y.

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Bradford, Pa.

Shenango & Allegheny R. R.

Trains are run by Standard Central Time

(90th Meridian.)

NORTHW'D. 6	NORTHW'D. 2	STATIONS.	SOUTHW'D. 1	SOUTHW'D. 5
P. M	A. M.		A. M.	P. M.
8 05	10 40	Ar....Greenville ...Dp	6 07	3 20
7 55	10 30	.....Shenango	6 17	3 33
7 45	10 17	....Kremis.....	6 29	3 44
7 31	10 08	.....Fredonia.....	6 37	3 52
7 25	10 02	..... Coolspring	6 42	3 56
7 23	10 01	.....Kerby Siding.....	6 43	3 57
7 12	9 50	..... Mercer	6 57	4 08
7 02	9 40	.... Pardoe	7 07	4 17
6 57	9 36	..... Filer.....	7 11	4 22
6 49	9 29	..... Grove City	7 19	4 28
6 46	9 26	..... Reed.....	7 20	4 30
6 35	9 16	.....Harrisville.....	7 33	4 41
6 30	9 12	.... Wick	7 37	4 45
6 25	9 07	.....Branchton	7 42	4 50
6 23	9 05	..Coaltown Junction..	7 44	4 52
6 19	9 03	.....Keisters..	7 47	4 55
6 11	8 56	.....Hallston	7 56	5 02
6 05	8 46	.....Euclid.....	8 07	5 11
5 53	8 37	..... Jamisonville	8 17	5 19
5 45	8 30	..... Oneida	8 30	5 25
5 35	8 20	..P. &. W. Junction..	8 40	5 35
5 25	8 15	Dp..... Butler.....Ar	8 43	5 37
		Pittsburg & Western.		
3 30	6 00	..... Allegheny.....	10 30	7 35
P. M.	A. M.		A. M.	P. M.

HILLIARD BRANCH.

10	12	STATIONS.	9	11
A. M.	A. M.		A. M.	P. M.
12 00	7 30	Ar...Branchton....Dp	9 10	6 30
11 50	7 20	.... .. Bovaird.....	9 20	6 35
11 30	6 56	.....Annandale... ...	9 40	7 00
11 20	6 48	.....Roy..	9 50	7 10
11 00	6 40	Dp ...Hilliard.....Ar	10 00	7 20

Trains 4 and 5 run daily with through coach service between Allegheny, Chautauqua Lake and Jamestown, N. Y. All other trains daily except Sunday.

I. D. STINSON, G. P. A, Greenville. Pa. J. T. Gen. Man. Greenville, Pa.

Western New York & Pennsylvania R. R.

(Formerly B., N. Y. & P. R. R.)

Time table in effect Dec. 4, 1887. Eastern time (75th Meridian.)

Train will leave Bradford for

GILLMOR, KNAPP'S CREEK AND OLEAN

Olean express..... ..... 7:15 a. m.
Buffalo mail .... 2:15 p. m.
Olean express..... 4:15 p. m.
Sunday train..... 9:15 a. m.

FOR DALLAS, RIXFORD AND ELDRED.

Eldred express..... ..... 8:30 a. m.
Eldred accommodation .... 1:40 p m.
Eldred express. .... 5:15 p. m.

Train leaving Bradford at 5:15 p. m. for Eldred makes direct connections for Williamsport, Harrisburg, Philadelphia and points East.

"Bradford Short Line"

FOR SONG BIRD, MARSHBURG, KINZUA, OIL CITY AND PITTSBURG.

Kinzua accommodation..... 6:30 a. m.
Pittsburg express..... .... 9:15 a. m.
Oil City express..... 4:20 p. m.

Get time tables giving full information from W. L. WELLS, Ticket Agent.
GEO. S. GATCHELL, Gen'l Supt.
J. A. FELLOWS, Gen'l Pass. and Ticket Agent, 84 Exchange street, Buffalo, N. Y.

Maps of Saxonburg.

A new and accurate map, showing the latest location of wells, can be had at THE DAILY OIL NEWS office, or will be sent post paid on receipt of one dollar. tf

THE PETROLEUM AGE.

VOL. VII. BRADFORD, PA., MAY, 1888. No. 4.

ADVANTAGES OF NATURAL GAS

AS SHOWN BY ESTIMATES IN THE MANUFACTURING OF IRON, ETC.

IN the current issue of the *American Manufacturer* an extended dissertation upon the uses and advantages of natural gas is given. The author shows by actual facts and figures what there is in the heretofore unknown natural element: There is, says he, probably no question more frequently asked by manufacturers outside of the gas district, whose products compete with those made with gas as a fuel, than "What are the advantages of natural gas?" that is, what are the advantages of this fuel in its use, in the character and amount of product, and in cost per unit of product over other fuels, especially coal. The question is a difficult one to answer. Some of the advantages are of such a character as to make it almost impossible to give expression to them, either by comparison of results obtained or of money saved. It is also exceedingly difficult to get manufacturers to finish the data upon which to base these comparisons. The necessary data would in many cases involve such an *expose* of the business of the party making the same as but few manufacturers care to give to the public.

For these two reasons, it is evident that any statement of the advantages of natural gas as a fuel in manufacturing must be general, and where actual figures are given in the nature of an estimate.

As to the advantages in its use. The advantages, in manufacturing, of a gaseous fuel, with high heat units, containing a very large percetage of heating gas and a very low per cent of practically no inert gases, from which constituents injurious to products, such as sulphur and phosphorus are absent, that requires no previous preparation to fit it for use, whose fire requires no watching, with which too high a heat is not obtained when it burns clear and too low when stoking, that is simply led into the works and to the place af use by a pipe, ready to be turned on or off as desired at a moment's notice, that leaves no debris of any kind—in a word, that is pure, intense, abundant, clean, is too evident to need any discussion. If there were no other advantages than those so-called minor and indirect ones, its value would be beyond question. Many of the difficulties incident to manufacturing would be removed, and much of the disagreeable and unpleasant labor in fuel consumption done away with. While these advantages are so great, it is evident, however, that we can give no expression to their value in many cases. The cost of removing ashes where coal is used can be arrived at in many instances, and the saving in this cost will be the measure of the advantages of the gas over coal in this respect, but what is the measure of the advantage of the nearness, abundance, and the control of the supply. There are advantages that will not only vary greatly at different works, but which cannot be expressed in formal terms in dollars and cents.

First, what effect has the use of natural gas had upon the quality of product? It is questioned if its use has materially improved the quality of the product of the iron mills. It is generally conceded that it has somewhat reduced the cost, made the work in the mills easier, and possibly made the average quality of the iron better, but there is a belief that as good iron could be made by good workmen with coal as a fuel as can be made by the use of gas. Indeed when gas was first used in some iron mills it was claimed that the gas-made iron was inferior to the coal-made. All iron contains more or less impurities, and in selecting pig iron for conversion into bars, sheets, etc., such a mixture is made as will give a product with none of the evil effects of these impurities. An iron a little cold-short is mixed with one a little red-short so as to give one neither red-short or cold short that is neutral. In some mills the slight amount of sulphur in the coal was relied upon to counteract the cold-shortness imparted by the phosphorus in the pig. When gas was used there was at first no change in the mixture of irons, and the sulphur of the coal being absent there was nothing to correct the cold-shortness of the phosphorus and the resulting bars, sheets, plates, etc., showed some cold-shortness. A change in the mixture soon remedied this evil.

While it is probably true that as good merchant iron can be made with coal as with natural gas, it is doubtless true that less care and skill is required to make a given quantity of iron with gas than with coal, and as a consequence it is probably true that the average of gas-made iron, is of a much better quality than the average coal-made iron.

On the hand it is beyond question that a better steel can be made with gas than with coal. The effect of variations in heat upon the quality of steel is much greater, or at least in using steel much more noticeable than upon iron. A heat that can be so controlled as to give just the right temperature, and that can be maintained at that degree without material variation, is of the greatest importance in steel making. A higher or lower temperature decidedly changes the character of steel, and even the variations that come from stoking coal fires make different bars of the same lot to vary greatly in character. The steady, uniform, controllable character of the gas flame and heat makes possible the production of a more uniform and better quality of steel.

As to the improvement its use has wrought in the quality of glass. The steadiness of heat, the freedom of the gases from sulphur and ashes, the intensity of the flame, and the ease with which it can be controlled, have united to greatly improve the quality of the glass made in the melting pots. The melt is more quickly made; the life of the pots is longer; there is no dropping into the uncovered pots of ashes from the coal, which would make seedy or imperfect glass; in the flattening and annealing ovens the character of the heat and the same absence of ashes and dust have resulted in the production of a glass with a much better surface, while in the glory hole of the flint works, the fire polish that is put upon the pressed ware is not only better, but the heat can be so regulated as to prevent the melting of the edges and the removal of that sharpness of outline which makes the pressed resemble the cut ware.

It is a well known fact in connection with the manufacture of window glass in this country that the difficulty in producing high grade glass has been chiefly in the flattening process. The metal of the American window glass has for years been equal to that made in any part of the world, but the glass has been spoiled in flattening, or its quality very much impaired. This fact has been true of American glass from the earliest period of its manufacture. In the fall of 1800 the commissioner of the city of Washington, then just made the seat of government, applied to Craig & O'Hara, of Pittsburg, to make for the public buildings some glass of a larger size than had ever been produced in the country. Glass of the size required, to the extent of some 400 square feet, was blown by Mr. Wendt, of the firm of Eichbaum, Wendt & Co., who were then operating the works. It is stated to have been "of a tranparency tolerably good," but it was spoiled in the flattening, and the glass for the public buildings was obtained from England. The use of natural gas has changed this, and in the only respect in which Pittsburgh glass has been inferior to that imported, that is in the results of the operation of flattening, it now equals the glass made in any part of the world.

As to the advantages of glass in increasing production, that is, in the amount of production. That the use of gas reduced in most cases the actual amount of labor involved is admitted, and that as a result more product could be made in a given time is also true, but the direct increase in production in most of the important industries using it have been quite small. This grows out of the fact that in most of these industries the

When the news of the Haymarket tragedy in Chicago reached Europe, M. Nobel was in Paris. "Look you," he exclaimed. "I am a man of peace. But when I see these miscreants misusing my invention, do you know how it makes me feel? It makes me feel like gathering the whole crowd of them into a store-house full of dynamite and blowing them all up together!" The Nobels carried on the manufacturing of explosives till about two years since, when their attention was turned to the wealth of the oil districts of Baku and the Caspian fields, the monopoly of which had been granted by the government for a term of years to an Armenian named Merzoeff, who would neither sell out, lease nor surrender his grant, till the Imperial Government was induced to cancel it in consideration of the services of Nobel, *pere*, to the Empire in 1855. These columns have so often told the story of the Nobels' operations in Baku that it is unnecessary to refer again to them. Suffice it to say that, if it be true that the dying have a mystic prescience of what is to be the outcome in the future of their labors in this world, there is no chance for American petroleum in the Old World. These are Ludwig's last words: "We—have at Baku a supply of oil sufficient for the needs of the world. I hope before long to supply the markets of the Eastern Hemisphere. The American oil wells may keep the Western world for themselves, but I think we will be able to keep their product out of Europe, Asia, and Africa." M. Nobel has died with this ambition unfulfilled. But his brothers will do their best to realize it.—*Oil, Paint and Drug Review.*

Standard Rebates.

Edward Houston, of the Globe Refining company, said to a Pittsburg *Commercial Gazette* reporter that the supposition among independent oil refiners now was that the Standard Oil company has not only been receiving a rebate on what oil they have shipped, but also on all the refined oil sent to the seaboard whether by the Standard or by independent firms, and that there was an agreement between the Standard and the Pennsylvania Railroad company and the New York Central railroad that in case of damage it was to be paid by the Standard. That, in fact, the Standard would protect the railroads. "We have no way of knowing this," he added. "It is the same with the settlement between the Pennsylvania railroad and the independent oil-dealers. of Pittsburg. It is generally supposed that all have received something from the Pennsylvania road, but it is impossible to tell how much. That they all have made claims is known, and it is probable that all were settled on the basis of thirteen cents per barrel rate."

H. M. Graham spoke in the same strain. "It is supposed that A. D. Miller & Sons received about $18,000, that being at a rate of 13 cents per barrel for the last two years. D. P. Reighard, it is known, was offered 15 cents per barrel by the Pennsylvania road, but refused. He has, however, made a settlement since, but it is impossible to find out on what basis. S. M. Willock has also settled and it is said on the 13 cent basis. Holdship & Irwin claimed about $30,000 on the 13 cent basis and by the law of 1883 claimed three times this amount. Their claim was refused, but since then the firm has been sold to the Standard company and Mr. Holdship is in the pay of that company, so that it is probable that that has already been adjusted.

"It is probable that the Pennsylvania road has paid $75,000 to local refiners to settle the matter," continued Mr. Graham, "and that this sum has come from the Standard company. There is, however, no way of getting a single case against the railroad company, and these investigating committees are mere whitewashing schemes gotten up by themselves."

Oil Mines of Scotland.

William Findlay, of West Calder, Scotland, which is in the ancient oil shale region of that country, has been making a tour of the Pennsylvania petroleum fields, and while in New York recently said to a reporter:

"I am more than amazed at what I have seen. The petroleum of Scotland is mined like coal, and although I had read of the oil wells of America, I was not prepared for the vast difference in the method of oil production. The Scotch petroleum is not in the fluid state, but in a shale formation. The extracting of the products of this shale was for many years an important industry, and is quite an extensive one yet; but the American oil, both illuminating and lubricating, is now set down in our markets cheaper than the Scotch oil can be produced, and how long our oil production will last is only a question of how long national pride will resist considerations of economy.

"The Scotch oil shale is black, and lies at a depth of about 400 feet beneath the surface. The shale producing regions are all between Edinburgh and Glassgow, and are known as the oil fields of West Calder. They are very extensive, and literally inexhaustible. That is one hope we have. The fluid oil of this country will undoubtedly become exhausted or greatly curtailed in production sometime in the future. When your fields cease to pour out a quantity of oil that enables you to refine it, export it, and sell it in Scotland at a less figure than it cost us to extract the oil from the shale at the very thresholds of Scotch markets, we will come to the front with our oil mines again, and know that whatever happens they can't be exhausted.

"When the oil fields of West Calder were being operated to a full capacity the shale refinery there, known as the Addiswell Oil Works, and which covers seventy-five acres of ground, gave employment to over 2,000 men. In various parts of the field there were shale crushing works, not unlike your coal breakers, where the shale is run on being taken from the mines. It is broken up into small pieces and the crude oil extracted at the crushers. What we call crude oil you would call tar over here. The refiners take it and from it extract illuminating and lubricating oil, ammonia and wax. The latter is called parafine in the oil trade of this country. The tar from a ton of shale will yield fourteen gallons of illuminating oil. This is subject to four different acid distillations, each one much heavier than any the American fluid petroleum requires. The result is a clear, white high flash illuminant, as good as American kerosene, but four times as expensive. If the American product simply came in competition with our illuminating oil, the effect on our trade would not be of much consequence, as in that branch of the Scotch oil business is not where the profit lies. The lubricant, the ammonia and the wax are the products which make the shale mines valuable. The American lubricating oil is cheaper, and those who use it say better than any. The latter altogether I can't agree with. Of course the American oil does not interfere with our ammonia products nor with our wax trade, but we can't afford to produce kerosene and illuminating oil to throw away in order that we may get at the ammonia and wax that the shale contains. I am forced to say, therefore, to use an Americanism, that the Scotch oil business is not booming at the present time." —*Reporter.*

Canadian Oil Report.

There does not seem to be much activity around the refineries: only the Imperial Oil company and M. J. Woodward & Co. appear to be running at all steady, the other manufacturers apper to be working up the stocks of illuminating distillate they have on hand, perhaps waiting for a tumble in crude to replete their already scanty stocks. They may be all right in their ideas, but with the present outlook we fail to see how low prices can rule again unless something very wonderful happens. No new fields are coming in for them to rest their hopes on. All the old scares are dead and gone; Euphemia, Bothwell, and only to-day a report from Comber comes in that the mysterious lower strata of oil rock found there has failed to pan out according to the high hopes and expectation of those interested there.

The following shows the business of the Petrolea Oil Exchange for the week ending May 10:

Date.	*Op'nd.*	*Closed.*	*Highest.*	*Lowest.*	*Clearances.*
May 4.....	1 14	1 15	1 15	1 14	3,803
5.....	1 14½	1 14½	1 14½	1 14½	2,404
7*.	.....	.....	.....	.....	1,123
8.....	1 14½	1 14½	1 14½	1 14½	602
9.	1 14	1 14	1 14	1 14	2,402
10..... ...	1 14	1 14	1 14	1 14	1,802

*No regular.

The total clearances on the Petrolea Oil Exchange for the week ending May 3, were 14,794 barrels; for the week ending May 10 were 11,417 barrels—*Petrolea Topic.*

Pleasantville Operations.

There is something of a second sand craze in the vicinity of Pleasantville and unruly operators are hard at work to the detriment of his brothers in the rest of the field. This paper has no interest in Pleasantville and would be pleased to see a better spirit prevail in that locality, it being such a marked exception to the rule. As a matter of news and to show what parties are at work the sub-joined is taken from a letter in the Titusville *Herald:*

Black Bros. are now running three strings of tools and talk of purchasing an additional set.

Black Bros'. No. 6, on the Black farm, just completed and reported as being dry in Wednesday's *Derrick*, is good for from 30 to 40 barrels.

The old well on the same farm is still producing 40 to 50 barrels per day.

It is rumored that Fertig & Henne, of Titusville, have purchased Black Bros'. interest in the Black farm, paying a handsome figure for the same. They are to be congratulated on securing so valuable a plant.

Bumsted, on the farm between Pleasantville and Jerusalem Corners, was torpedoed on Tuesday, and is producing

from the second sand. It will settle into a five or six barrel well. No water was found in the sand, and a packer will be put in and the well made to flow like Clarendon wells.

Black Bros. have stuff on the ground for a rig on the McCaslin farm, adjoining the Bunsted on the north. It will be drilled as soon as a rig can be built.

James skinner has a rig up on his lot near Merrick stoeet. Braden. Bros. nave the contract. They are drilling for gas, and the location is supposed to be on the gas streak that Brown got his well in.

Black Bros. have secured by purchase and lease the Lytle farm, near "Tight Pinch," about two miles south of town, and have twe wells drilling for the second sand.

Black & Noyes have a rig up on the S. S. Pratt farm, about one and a half miles east of town, and will start drilling this week.

Braden Bros. have the contract for two wells for the Russel Bros., about one mile south of Shamburg.

Black Bros. have leased the Lewis farm, near the Blank farm, and have a rig building.

Dunham & Shelmadine are getting ready to drill on their lease west of town.

Black & Lockwood have timber on the ground for a rig on the Lockwood farm, lying within the boro limits.

It is impossible at present to give a complete list of operations, and there is a very large amount of land that is not mentioned.

After Deeper Gas Strata.

J. M. Guffy is now drilling several new wells on the Montgomery farm in the Murraysville field to test the district and find out whether there is not another deposit of gas to be found under the present existing strata of gas. Mr. Guffy has for a long time entertained the belief that there should be another deposit. In reference to this subject he told a *Dispatch* reporter: In Hickory, Canonsburg and several other fields a deeper drill made in an old well has frequently proved successfnl, and I have often wondered why such a thing has not been done in Murraysville. My experience in the oil business has taught me that very often when a well of oil gave out and it was drilled deeper a large and constant flow of oil was obtained; and while there is a difference between oil and natural gas, I do think that in this point they are similar. Anyhow I am going to find out and in a few days I shall know whether there is not a new deposit, richer and more permanent than the present one.

Drillers Will Wait.

The drillers held a meeting the first of the month to consult as to the expediency of selling some of their oil in order to secure funds for the regular monthly payment, which is due to-day, or to endeauor to negotiate a loan on the oil on hand and wait for better prices before making a sale. There was a general kick against sacrificing any oil at the present prices, though there were a few that favored a sale, and it was practically concluded to negotiate a loan. The drillers have about 700,000 barrels of their first million barrels of oil left, and as there are six months of the shut-down period left, during which time a permanent advance in prices is confidently expected, they are not willing to drop 250,000 barrels or more at prevailing price in order to pay the monthly roll. A loan is the only alternative, and this will be secured. It is understood that some members of the union have gone to the front and accepted positions to drill and that they will shortly be expelled.—*Titusville Herald.*

NATURAL GAS AND INSURANCE.

A SCHEME TO PREVENT EXPLOSIONS IN THE FUTURE.

THESE topics have been frequently coupled together since the Buffalo explosion. At a meeting of gas men, aldermen and insurance men to talk it over, Tuesday, C. N. Payne, manager of the Standard gas interests, submitted a plan of his own to obviate blowing up the city. It is proposed to erect at or near the regulators iron tanks six feet high and six feet deep. A pipe will be connected with the supply main in the street and run into the tank. This pipe will be open at the bottom and the tank will be partly filled with a fluid, most likely oil, which will not freeze. Sufficient oil will be used so that the pressure of the gas cannot exceed eight ounces to the square foot, or the pressure may be fixed at any minimum figure considered necessary or advisable. If through any cause the pressure exceeds the limit fixed the gas will be forced upward and will escape through a stand-pipe running out of the top of the tank. "The advantages of this device," said Mr. Payne, "are that it has no valves, no levers, no weights, other than the fluid used to confine the gas in the pipe." The bottom of the tank pipe will be shaped like an inverted T, with opening at each end of the base, allowing a free escape of the gas into the fluid.

"I can see no possibility of the device getting out of order. Gauges will be used to determine the pressure, and the fluid will remain stationary and entire, except, of course, as it may be diminished by evaporation. It is proposed to have watchmen at each regulator or tank. I never thought of such a device," continued Mr. Payne, "for I never saw any necessity for it. Out of thirty-one cities and towns where natural gas is used this is the only occurrence of the kind ever known. I regard this device as absolutely certain to prevent any similar trouble. It is proposed to put in four, six or ten of these escape-tanks, as many as may be required to assure safety. If the device meets approval, the tanks will be built immediately. As a temporary safeguard two new valves are to be put in to replace the valves believed to have caused the trouble."

"From the investigation you have made are you able to say what caused the excessive pressure and the explosions of last week?"

"We have not discovered the cause," said Mr. Payne. "The only explanation I can give is that some foreign substance got into a valve, holding it slightly open in the night, when there was little consumption, thereby allowing the pressure to run above the normal state." Mr. Payne explained the construction of the regulators, the position of the tanks, and showed how a foreign substance might open a valve and allow high-pressure gas to flow into the low-pressure main.

"It is possible," continued Mr. Payne, "for a foreign substance to get into a regulator valve. At this season of the year we go over the entire line, caulking every leak and fixing loosened joints. There are over 18,000 joints on the line from the wells to Buffalo. It is possible that scales of iron and slivers, knocked loose in caulking, may have got in and caused the trouble. The first cause of the trouble was something preventing a valve from shutting close or tight enough, which resulted in a gradual increase in pressure until it reached such a point that it blew the fluid-seal out of the gasometer. After the seal was blown out the tank would return to its place, which would open the valve, causing the excess of high-pressure gas to pass into the low-pressure lines. A very small substance would hold a valve open."

The pressure of natural gas is regulated between the wells and Buffalo as follows: The pressure at the wells, Mr. Payne stated, is between 800 and 900 pounds. There it is reduced to 380 pounds. At De Golia, twenty miles from the wells, the pressure is 160 pounds and at Buffalo, at the city line, the pressure is 20 pounds.

There are three different systems of conveying gas to consumers, said Mr. Payne. The first, known as the Westinghouse high-pressure system, is that by which a single pipe is used to carry the gas to all consumers. The gas is carried under a pressure of from 10 to 20 pounds, the mains being laid up to the cellar walls of the consumers' houses. The pressure is regulated by a device inside of the cellar.

Another is known as the William Hartupel system. All of the main lines of pipe which supply consumers are of one size. In the same trench are placed the high-pressure pipes and at each block the supply of gas is controlled by an automatic regulator.

The third system is that used in Buffalo, where each street contains a main sufficiently large to provide for the consumption of gas on the street. The high-pressure lines, said Mr. Payne, are brought only to distant portions of the city, the gas being fed into the supply mains by regulators. The method is known as the tank-gasometer system.—*Express.*

The Refined Market.

The refined market for the month of April was active and steady, more so than for the month previous. The New York, Philadelphia and Baltimore markets fluctuated about ¼c and reached the highest point of the month just at its close. At the foreign ports the refined was very changeable. London and Bremen, for some unknown reason, seemed to decline from the opening of the month, and on April 30 was quoted at the lowest point of the month. The market at Antwerp changed but not as widely as the other foreign ones, and closed ¼f higher than the beginning. On account of the peculiar condition of the crude market it is believed that there is to be an advance in the near future and many orders have been put in under this supposition.

This is what the New York *Tribune* says concerning the condition of the present state of the refined petroleum: "The refined market has developed a decided change in tone; not that a big business was started, but that trading did improve, and a more general inquiry for goods brought the current market fully up to that for future delivery. There are many close observers of the refined situation who believe that the foreign movement has been fairly started, but even if they are mistaken, the season when heavy pur-

chases will be compulsory is rapidly nearing and it will find what was not dreamed of a year ago—a strong crude position backing up the refined market and the November agreement of the two interests—producer and refiner—maintained intact."

Towards the close of the month a New York correspondent expresses the following concerning the situation:

The demand for refined in barrels for export has been fairly active and steady, shippers taking advantage of the low freight rates which have continued to prevail, while it is also certain that they apprehend an advance and placed their orders partly in anticipation of such a change. The sales reported approximate 8,000,000 bbls. a good week's business for the season of the year. The price remained steady at 7⅜c for 70 deg Abel test until to-day when the price was advanced to 7½c for all loadings. The stocks abroad remain light and this may prompt a continuance of activity, though shippers claim that if there should follow an advance in freight rates to be added to the increased price of oil it would materially check the export demand. The foreign markets have changed but little, to-day's quotations by cable being: Bremen, 6 35m; Antwerp, 16¼@16⅜; London, 5⅞@6d, and Liverpool, 6⅛@6¼d. Freight rates show no quotable change, the rate to London being 1s 4½@ 1s 6d, though tate to-day the latter figure was the prevailing one. To Continental ports the range is 1s 6d@2s as to port and vessels. Home trade lots have been in light request, but are firmer. We quote 8⅜@8¾c for 120 test; 8¼@8⅜c for New York City 100 deg. fresh, and 8¾@9c for 150 deg. water white. Western lots are quoted at the same figures.

Cases for export have been in irregular demand, and the past few days almost neglected, the total sales reported footing up about 160,000. The price continued steady at 9⅜c for plain tops until to-day, when an advance to 9½c was announced. Freight rates continue favorable. The rates for large vessels are: For Java, 23@24c; Japan, 27@28c; Calcutta, 18@19c; Bombay, 19c; Rangoon, 20c; Singapore, 21@22c; HongKong, 21@22c, and for Shanghai 28@29c.

Crude in barrels for export has been in good demand and sales of about 40,000 bbls. are reported. Prices have remained steady at 6⅝@6⅞c, for Bradford and Parker respectively. Cases for export have received little attention, and no sales are reported. Prices are unchanged at 8⅝@8⅞c.

Prime city naphtha has remained unchanged at 7c. For export there has been a light demand and only a few small sales are reported.

Western residuum, 42@51 deg. test, is quoted at 1½@1¾c f o b. Barrels are quoted at 5@5½c. No sales are reported for export.

Mr. Geo. H. Lincoln's monthly circular gives the following figures on the clearances of refined petroleum, in cases, for China and the East up to the 30th of April for the years of 1887 and 1888:

	1888 Cases	1887 Cases
China	718,200	781,568
Japan	895,273	935,127
India	800,020	1,169,260
Java, Signapore, etc	1,175,996	601,614
Total April 30	3,589,489	3,487,569

Increase during April 1888, 101,920. During the last week of the month 309,255 cases were loaded and left the harbor of New York alone. Two of the largest shipments were made to differenet parts of India.

REFINED QUOTATIONS FOR APRIL.

	New York	Philadelphia	Baltimore	Liverpool	London	Bremen	Antwerp
	Cts.	Cts.	Cts.	Pence		Reichmarks.	Francs
2	7⅜	7⅜	7⅜		6¼	6.50	16
3	7⅜	7⅜	7⅜	6	@6¼	6.40	15⅛
4	7¼	7¼	7¼		6⅛	6.45	16
5	7¼	7¼	7¼	6	@6¼	6.35	15⅞
6	7¼	7¼	7¼	6	@6¼	6.35	15⅞
7	6⅜	6⅜	6⅜	6	@6¼	6.40	16
9	6⅜	6⅜	6⅜	6	@6¼	6.35	16
10	6⅜	6⅜	6⅜	6 1-16	@6⅛	6.25	16
11	7⅜	7⅜	7⅜	6 1-16	@6⅛	6.25	16
12	7⅜	7⅜	7⅜	6 1-16	@6⅛	6.25	16
13	7⅜	7⅜	7⅜	6 1-16	@6⅛	6.25	16
14	7⅜	7⅜	7⅜	6 1-16	@6⅛	6.25	16
16	7⅜	7⅜	7⅜	6 1-16	@6⅛	6.25	16
17	7½	7½	7½	6 1-16	@6⅛	6.25	16¼
18	7½	7½	7½	6 1-16	@6⅛	6.25	16¼
19	7½	7½	7½		6 1-16	6.20	16⅛
20	7½	7½	7½		6 1-16	6.20	16⅛
21	7½	7½	7½		6 1-16	6.20	16⅛
23	7⅜	7⅜	7⅜		6 3-16	6.20	16⅛
24	7⅜	7⅜	7⅜		6⅛	6.10	16
25	7⅜	7⅜	7⅜		6⅛	6.15	16
26	7⅜	7⅜	7⅜		6⅛	6.15	16
27	7⅜	7⅜	7⅜		6⅛	6.15	16
28	7⅜	7⅜	7⅜		6⅛	6.30	16⅛
30	7½	7¼	7¼		5⅞	6.35	16¼

Canadian Oil.

Although prices for our raw material are dropping somewhat, the trade expansion looked for is coming slowly. There is no doubt that buyers of refined oil have become a little uneasy at the declining crude prices, and jobbers and retailers in all places feel unsettled as to their future investments. One thing, however, there can be no doubt of, and that is the fact that the petroleum trade both as far as producers and manufacturers are concerned, never was on a more solid and thoroughly substantial basis. The great trouble, however, is the financial stringency, but anyway even with that great drawback, enterprise is scarcely haulting, and those that are in a position to do so invest in crude with their usual confidence. We believe the dropping tendency in prices has about reached its limit, and with the removal of the annoyance resulting from restricted banking facilities here, there is no reason why the business should not improve in all directions, and this is what is most likely to happen. It is interesting to note the arguments pro and con as to an early failure of the supply of petrolem. An oil field is just as certain to become exhausted in time as an orange is if you keep sucking at it. Years ago Oil Springs turned the head of all creation for a while, and as long as the wells were not drilled the shallow depth held out. But all at once it retired from business, then after a lapse of several years our enterprising townsman, A. T. Gurd, after bonding a large tract of land at the springs and vicinity demonstrated the fact that a large supply of the greasy fluid could be obtained at a lower depth. Then from a deserted village and in resemblance of a fenced in pasture field Oil Springs to-day has become a thriving and prosperous place, with a police station, a brass band, and other luxuries too numerous to mention. Should the price of petroleum depend upon the supply below ground, it would be folly to speculate on its possible exhaustion. The limit for daily or monthly production has never been accurately determined. What the producing capacity of our oil region here may be, is, and will for a long time perhaps remain unknown, as these fields will not be developed until the older ones fail to supply the oil required. The fact remains that the consumption is already increasing, and that the surplus above ground is already declining is sufficient to offset or overbalance all other influences affecting the market value of our crude. In that half-way house of the brain, where the mind halts twixt sleep and waking, have been born phantasies that have left their imprint on the histories of nations. In all ages significance has been attracted by some, to those illusions of the half resting brain called dreams. We remember in the early days of Oil Springs the dream book was to be found in every boarding house, and the price of "interests" was largely governed by the reading therein. Not that the hard-headed, practical men who built up the oil industry were believers in dreams as a class, for they were not. But hordes of superstitious adventurers swarmed in the region then who invested their money according to the interpretation of these dreams. If our space allowed we could give many an instance of the location of a well on account of a dream, but will give one we personally know to have been acted on.

In this instance a young man jilted by a girl in Buffalo, because of his want of means, resolved at the time of the oil excitement to go to the Oil Springs oil region and make or bust. He dreamed the night after his refusal by the young lady that he stood in a wild mountain spot alone. An Indian, hideous in war paint, sprang from a thicket and rushed toward him with uplifted tomahawk. He resigned himself to his fate, when the coquette who had jilted him appeared with a rifle, which she handed him and disappeared. He covered the Indian and fired. When the smoke cleared away the Indian was gone but at the spot where he stood was a gushing oil well. The young man went to Oil Springs and while there walking on the flats one day saw a spot just like the one in his dream. He purchased an interest in the location and on the spot a well was drilled, a gusher obtained and called the Coquette, a well as coquettish in its production as the young lady for whom it was named was in her affections.—*Petrolea Topic.*

Is Petroleum a Poison?

Dr. Lewin, who is well known from his publications concerning erythrophlœine, discusses this question in *Virchow's Archive.* After referring to his researches he states that petroleum varies very much in composition, and that this difference is an important factor in the effect of the liquid. He also remarks that the elastic meaning of the word "poison" must be borne in mind; one party postulating the supervention of death as an essential concomitant of real poisoning, while another considers any disturbance of normal health sufficient to justify the use of the expression. Lewin found seventeen cases in literature referring to the ingestion of petroleum, many of which were instances in which the liquid was mistakenly swallowed for brandy by inebriates, who were under the impression, until (in some cases) more than three ounces had been taken, that they were drinking spirits. Others had resorted to it with suicidal intent, and in these cases it had sometimes been taken by the pint. Two patients imbibed from 6 to 12 oz. without any serious effect at all. It has been alleged that the urine of

a person who has swallowed petroleum has the characteristic odor of the substance and some have affirmed that where a large quantity is introduced into the system it forms a supernatant layer upon the surface of the discharged excretion. Lewin specially directed his attention to these alleged phenomena, but in his researches on animals he was never able to detect any smell of the petroleum nor any of the compound unchanged. Lewin's conclusions are that the effect produced by the internal administration of petroleum is stronger in proportion as the liquid is impure, and that it may be considered as a kind of poison, using the word in a wide sense. He considers that the influence of petroleum vapor is only toxic in very unfavorable conditions and in cases of individual idiosyncrasy. Researches conducted directly in America among workers in petroleum districts who were constantly under its influence showed that it favored the development of eczematous ulcers, which invaded every part of the body. The heavy oils appeared to be more dangerous than the light, and it was further intimated that those used for illuminating are always of the latter and safer class.—*Reporter.*

Gas Stoves in Germany.

While the electric light is gradually taking the place of illuminating gas, the latter is evidently going to meet with an extensive use in another direction on account of its considerable evolution of heat. In comparison with the electric light it is this property which is—apart from minor brightness—considered as its principal deficiency. It is stated that the heat of a kilogram of gas amounts to 13,000 calories, while from a kilogram of pit coal on an average only 7,500 calories can be obtained. In other countries this heating power has been applied already for economical as well as industrial purposes. In Germany, however, such an application is to be found only in comparatively few cases, because its practical value, though proved and acknowledged by experts, is still doubted by a part of the public, while to another part it is either insufficiently or wholly unknown. Particularly the offensive smell and great expenditure from the principal objections, and they are, considering the quality of most of the gas stoves hitherto used, not unfounded. Lately some technologists and manufacturers have succeeded in inventing and introducing new systems, and it is attributed to their efforts that the people at large take a greater interest in the subject. The administrations of gas-light companies are also striving to bring to the knowledge of the public the economical value of gas heating, thus complying with the fundamental principles for an extensive introduction. Moreover, in some of the largest cities like Berlin, Leipsic, etc., the price of gas for heating purposes has been reduced, and temporary as well as permanent exhibitions of gas stoves have been brought about to facilitate a complete knowledge of their uses and advantages. In Leipsic even cooking apparatus are let for a comparatively small compensation, to give also private persons an opportunity to get acquainted with them. Of still greater importance are the efforts apparently accompanied with decided success of the International Association for Culinary Art, having its seat in Leipsic. At a culinary exhibition held by this society during the past year attention was called to a number of gas stoves of various systems. A public examination on the 25th of October last, in the same city, convincingly proved the practicability of this mode of heating. The trials were made on gas-hearths of different construction by members of the culinary association in the presence of visitors and with dishes of the simplest and of the most artful kind. For comparative purposes ordinary hearths were used at the same time. The apparatus applied were of German, Swiss, English, and of French origin, and all had been supplied by the Leipsic Gas-Light company, and provided with a gasometer to state the exact consumption of gas. Neither an offensive smell nor great heat was perceivable on the occasion, while the cleanliness and conveniency were remarkable. The gas cooking proved easy to regulate, and required no further work after the dishes were done. The chambers of wood and coal become superfluous. There are no ashes or soot, and repairs are only necessary in exceptional cases and to a limited extent. The apparatus are easily transported and can be applied in any locality. They are to be preferred, owing to the quickness with which food is prepared, accounting partly for their cheapness. A family meal required only ten minutes time and 15 pfennige (3½c.) worth of gas: the baking of oysters not quite a minute, consuming 10 liters of gas; four kilograms of roast mutton, ten minutes, with 0.25, and five kilograms of roast beef, ten minutes, with 0.3 cubic meter of gas. Taste and appearance of the food were excellent.

I recommend these facts to the serious consideration of our manufacturers of gas stoves, as here is doubtless a market giving promise of an extensive business. If proper steps are taken our manufactures will find a ready sale, as I know by experience that they are far superior to any others.—*Charles Neuer, Consul.*

Natural Gas in China.

Chas. Denby in a letter to the Department of State of the United States sends the following abstract of an account given by Baron von Richtofen of natural gas wells in China. These wells are found in Sz'chwan, near a town called Tsz-lin-tsing. In an area of twenty-seven li (9 miles) diameter salt wells are found. To make a well the Chinese use a long and elastic bamboo pole, supported in the middle by a cross piece, a rope made by coupling the ends of long (not twisted) slices of bamboo, and an iron instrument which weighs 120 catties (catty=1⅓ pounds). The rope is fastened on the thin end of the pole, and the iron on the end of the rope. A slight up and down motion of the thick end of the pole makes the iron hop and bore a vertical hole with its broad, sharpened edge. The ground to be perforated consists chiefly of sandstone and clay. When a portion of the rock is mashed clear water is poured into the hole, a long bamboo tube with a valve in the bottom is lowered and the turbid water raised to the top. Pipes of cypress wood are rammed in to protect the sides of the bored hole and to prevent the water contained in the surrounding ground from getting access to the well: the pipes are attached to each other at the ends with nails, hemp, and tung oil. The inner width of the pipes is about five inches. As the work proceeds the pipes are rammed deeper, and a new one attached on the top; the rope, too, is made longer. At a depth varying from 70 to 100 chang (700 to 1,000 feet) the brine is struck, and the well is fit for use. The brine is raised to the top through long bamboo tubes and bamboo rupes, as described, by means of a horsewhim, and then carried to large pans for evaporation, or led to to them through bamboo pipes.

Besides these wells there are others, which are bored to the depth of from 1,800 to 2,000 feet. At that distance below the surface petroleum is struck. Immediately on reaching it an inflammatory gas escapes with great violence. Work is now stopped, and a wooden cap fastened over the mouth of the pit, perforated by several rows of round holes. In each of them a bamboo pipe is inserted, and through these the gas is led under the evaporation pans. The pipes ramify, and on each end a tapering mouthpiece, terminating in a small apertnre, is attached. The gas is then used for evaporating the brine.

The enterprising spirit which induced the Chinese to examine the ground at so great a depth is said to have had its origin in the drying up of a brine pit. The proprietor was in hopes of meeting brine at a greater depth, but found instead the gas.

When the country was infested with rebels during the Taiping rebellion they removed the cap from one of the gas pits and set fire to it. Since that time, or at least up to the time that Baron Richtofen wrote, a long column of fire rose from that pit, and it is considered nearly impossible to stop the flame.

The gas pits and brine pits are owned separately by corporations. The owners are subjected to the control of the government. The government monopoly is in the hands of the "Taotai," who resides at the place. The salt works of Tsz-lin-tsing yield considerable revenue to the government, and have besides enriched numerous proprietors, and give occupation to numerous population. The number of "fire pits" is twenty-four, and the the salt pits are innumerable. Some of them do not enjoy the advantages of gas. The brine is evaporated with grass and wood.

There are salt pits in neighboring localities on the Min River, but no gas pits. —*Charles Denby.*

A Noted Case.

A famous oil case has just been ended at Kittanning after a four days' trial. The children of Farmer David Burford deserted him in 1878 and in 1879 he and his aged wife gave Franklin Miller a deed for their eighty-six acres of land, provided he kept the couple until they died and decently buried them. Mrs. Burford died in 1881 and in 1884 Mr. Burford passed away at the age of 84. Soon after oil was discovered on the farm and the Burford heirs promptly entered suit to eject Miller.

During the trial just closed twenty-eight witnesses were examined. The heirs attempted to prove that Burford was of unsound mind in 1879 and therefore not competent to make a deed. The defense showed that though Burford was blind and almost deaf his mind was healty. Judge White thereupon instructed the jury to find a verdict for defendant.

Over 150,000 barrels of oil have been produced from the old Burford farm. Franklin Miller has already received $25,000 in royalty and the farm still yields him reward for his kindness to poor old Farmer Burford.

PREVENTING EXPLOSIONS.

A SUBJECT THAT IS AGITATING BUFFALO JUST NOW.

THE city of Buffalo is pretty well stirred up over the recent natural gas explosion, and measures are being taken to guard against a repetition of them.

Fire Commissioner Hopkins when asked as to his opinion of the natural gas question said that the communication to the Council expressed all that he desired to say. "We have seen what the natural gas has done," said he, "and the same disaster doubly increased is liable to be repeated again. I think that the citizens are pretty well aroused on this question, and I am very confident that some measures of protection should be adopted. I was looking at a volume published in Philadelphia this morning and I wish you could see it. In the Pennsylvania cities where they are acquainted with the nature of natural gas, they are not allowed to put it into a house unless a certain automatic governor is used. I am glad that the *News* is stirring the people up on this question, for it will bear investigation."

Fire Commissioner Zeller was asked this morning: "What action do you think the Common Council will take on your recommendation to shut off the supply of natural gas from the city?"

"I do not know. Our recommendation was sent to them, but what action they may take on it I cannot tell."

"What reply have you to make to the natural gas people, who say you should have acted with them?"

"I did not know they had made any explanation to the public before I read it in the *News* yesterday."

"Do you think the gas people will take more precaution in the future?"

"I have no reason to think they will not. But they should make some strong assertion to the people that there will not be a re-occurrence of the explosions."

"Who do you think should give such a positive guarantee to the public?"

"Some expert who is not interested in either side."

"Do you use natural gas?"

"Yes, and I should be very sorry to do without it. It is a nice clean fuel, but I do not like to take chances of having myself and family blown up at almost any minute."

"Have you seen the proposed new safety guard?"

"No, I understand they have one, but until the efficiency of that is proven I think some immediate safeguard should be adopted."

"You did not mean that you advised the supply should be entirely cut off from the city unconditionally?"

"No. If some positive guarantee can be given that another explosion will not happen before they get their safety guard in working order."

"Do you think private houses and places where there are meters should have more protection."

"Yes; I think it would be a good idea for the company to place in each house that has the gas a safety valve to prevent an undue pressure."

"Then your idea is, if some guarantee cannot be given immediately, the supply be entirely cut off until the time they can prove beyond a doubt there is no danger?"

"Yes; that is my idea exactly."

The New York *Tribune* has the following: Daniel O'Day, president of the Natural Gas company, was asked about the Fire Commissioners' recommendation this afternoon. He said he was greatly surprised and considered it unwarranted. He continued: "It is a mistake to suppose we are ignorant of the cause of the recent explosions. Since St. Paul's Cathedral burned, our engineers have been diligently at work, and a most careful investigation has shown that it was the failure of the automatic valve to work. Some foreign substance got into it."

Mr. O'Day added that there were four valves doing the work of gasometers, in regulating the supply, and that by means of a safety vent, or plug, which was being attached to the service, if unusnal pressure occurred the surplus gas would blow out into the air and do no damage. "I don't believe he said, "that the aldermen will exclude us from the city. They might as well shut out a railroad because a car ran off the track."

Liquid Hydro-Carbon vs. Coal.

The advantages in the use of liquid hydro-carbon, as compared to coal, are:

First. In handling. Petroleum can bo transported in tanks, and pumped inte suitable reservoirs, which can be done by the operator attending the furnace, while coal requires much more labor and expense.

Second. In storing. For equal heating capacity it requires one-quarter the space of coal.

Third. Combustion. Petroleum is a pure hydro-carbon, and its combustion yields nothing but water and carbonic acid, while coal contains sulphur, phosphorus and other deleterious minerals objectionable for metallurgical purposes and other operations, and its combustion not being controllable, it carries off a large portion of unconsumed air, carbonic oxide, and particles of ashes.

Fourth. From losses inherent in the condition and nature of the combustible. Coal contains on an average 15 per cent. of non-combustible constituents, which must be deducted from its weight to obtain its combustible elements, besides the labor in handling, while petroleum is all combustible.

The combustion of coal in the common grate surface requires double the theoretical supply of air, thus reducing the thermal effect by half in heating the additional air from the heat of the furnace, expending from 15 to 25 per cent. of the total heating power of the fuel, according to the temperature of the waste gases, while petroleum, being under complete control, requires no excess of air.—*The Safety Valve.*

To Make Oil Gas.

The stockholders of the Northwest Gas Improvement company, which was organized a year and a half ago, held their annual meeting in Pittsburg during the second week in May. Their election held at that time resulted in the seclection of H. Lafferty, as President: J. K. Hatfield, Vice Tresident; H. O. Spangler, Treasurer; and J. G. Ihmsen, Secretary. The patent which this company holds covers the States of Ohio, Indiana, Illinois and Michigan. The object of the company is to manufacture gas for illuminating and heating purposes from the crude petroleum. They have completed a plant at Columbiana, Ohio, for the purpose of testing the process. The oil will be shipped to the plant from the oil fields of Lima and Findlay. The officers at their meeting expressed great confidence in the success of their scheme.

April Production Report.

Reports of the stocks at wells in the Bradford field received by THE PETROLEUM AGE show a decrease of .98 barrels to the well during the month of April. Stocks reported at wells in the Allegany field show a like decrease of .83 barrels per well. The total number of wells connected with the pipe lines in the Bradford field on April 1 was estimated at 14,100, and the number in the Allegany field 4,000. From the above data it is found that the average daily decrease in stocks in the Bradford field was 461 barrels. In the Allegany field it is found by the same computation that the stocks at the 4,000 wells decreased 111 barrels per day. The average daily pipe line runs from the Bradford and Allegany fields were 17,363 barrels. Subtracting the daily decrease in stocks from the pipe line runs the figures are tabulated as follows:

Total runs both fields	17,363
Decrease Bradford stocks	461
" Allegany "	111
Daily decrease both fields	572
April's estimated daily production Bradford and Allegany fields	16,791
March's estimated daily production Bradford and Allegany field	16,771
Daily increase in April	20

MARCH PRODUCTION REPORT.

Reports of the stocks at wells in the Bradford field received by THE PETROLEUM AGE show a decrease of .3 barrels to the well during the month of March. Stocks reported at wells in the Allegany field show a like increase of 2.7 barrels per well. The total number of wells connected with the pipe lines in the Bradford field on March 1, was estimated at 14,100 and the number in Allegany field 4,000. From the above data it is found that the average daily decrease in stocks in the Bradford field was 137 barrels. In the Allegany field it is ascertained by the same computations that the stocks at the 4,000 wells increased 316 barrels per day. The average daily pipe line runs from the Bradford field were 13,378 barrels and from the Allegany field 3,214 barrels. Adding the daily increase in stocks to the pipe line runs the figures are tabulated as follows:

March daily average Bradford runs	13,378
" " " Allegany "	3,214
Total runs both fields	16,592
Decrease Bradford stocks	137
Increase Allegany "	316
Daily increase both fields	179
March's estimated daily production Bradford and Allegany fields	16,771
February's estimated daily production Bradford and Allegany fields	16,865
Decrease in March	94

WARREN, FOREST AND LOWER COUNTRY.

Reports were received from groups of wells in the different sections of Warren, Forest and the Lower Country. The number of wells on the 1st of each month, with their averages, are contained in the following statement:

	No. wells May 1	*No. wells Apr 1*	*Av. per well May 1*	*Av. per well Apr 1*
Clarendon and Tiona	51	35	9	15
Cooper District	125	135	16	16
Lower Country	106	106	43	55
Miscellaneous	38	38	49	42

As Macksburg oil is used in the same way as that of the fields of New York and Pennsylvania, there is no good reason

why the Macksburg runs should not be counted in the runs of the oil regions. Hence they are included in the outside runs for March and April in making the following estimates on production:

Field.	April. Barrels.	March. Barrels.
Bradford and Allegany	16,791	16,771
Outside Runs, including Macksburg	27,146	26,134
Total	43,937	42,905
Increase	1,032	

Compared with the month of April, 1887, there is a decrease of 20,620 barrels. The average daily production for the month of April, 1887, including the Macksburg field, was 64,557 barrels.

In the above estimates no account is taken of the "dump oil" loaded on the cars direct from the wells at Emlenton and other points in the region. The Lima runs by the Buckeye pipe lines were 11,081 barrels a day in January, 14,583 barrels a day in February 17,625 barrels a day in March 19,278 barrels a day in April.

The following table shows the comparative production of the New York, Pennsylvania and Macksburg, O., oil fields for 1886, 1887 and 1888:

	1888.	1887.
January	37,723	64,429
February	42,785	63,724
March	42,905	63,392
April	43,937	63,447
	1887.	1886.
January	64,429	57,272
February	63,724	57,840
March	63,392	59,764
April	63,447	63,027
May	63,253	68,198
June	62,275	74,454
July	60,005	73,887
August	59,121	76,657
September	60,145	78,228
October	58,942	77,009
November	42,414	72,695
December	40,390	67,790
Total	701,537	826,821

Petroleum Engine.

For some time past a firm at Hull have been endeavoring to overcome the difficulties which have hitherto stood in the way of using the ordinary petroleum of commerce as a motive power for engines. In this they have now fully succeeded, as was demonstrated by a petroleum engine which we recently inspected at their London offices. In this engine the oil is placed in a closed tank inside the foundation of the engine, and air is pumped into this tank until a pressure of about five pounds to the square inch is obtained. The oil is then mixed with air until it is formed into a vapor, after which it passes into a closed iron vessel or vaporizer, where it is heated, and from which it is admitted into the engine cylinder and ignited by means of an electric spark. The spark is obtained from a small primary battery capable of doing about 30 hours' work without attention, and which can be renewed at a very small cost. In starting the engine the vaporizer is heated for a few minutes, after which the necessary heat is obtained from the exhaust products of combustion while on their way to the chimney. The cylinder is water-jacketed, the water being kept in circulation by a small pump. After it has once been started the engine works automatically, preparing its own source of power, heating its charge, cooling its cylinder, and supplying its own spark for ignition. The great point here is that only ordinary petroleum is used, which, moreover, is entirely consumed, leaving no residue whatever, the combustion being complete. The cost of working this engine, taking the oil at the present price, is stated to be a little more than a halfpenny per horse power per hour. The engine is simple in construction and is well adapted for use where steam is inadmissible and coal gas not obtainable. It has been thoroughly tried and proved in practical work before being brought out.—*London Standard.*

Runs, Shipments and Stocks.

RUNS OR RECEIPTS.

PIPE LINE.	March, 1888.	April, 1888.
National Transit	925,107.03	940,647.05
Tidewater	115,615.14	115,497.52
Octave	2,409.47	1,876.03
Pittsburg	55,302.27	65,042.17
Southwest Penn'a	135,656.26	124,575.42
Western & Atlantic	73,134.65	66,452.53
Macksburg	17,283.93	21,186.76
Total	1,324,508.75	1,335,277.48
Daily average	42,726.09	44,509.48

In the above tables only oil received direct from the wells is taken into account.

DELIVERIES OR SHIPMENTS.

PIPE LINE.	March, 1888.	April, 1888.
National Transit	1,764,167.73	1,590,640.89
Tidewater	182,219.45	200,951.37
Octave	2,130.48	2,188.04
Pittsburg	57,165.95	66,299.00
Southwest Penn'a	14,419.15	21,850.30
Western & Atlantic	47,066.78	44,654.21
Macksburg	4,121.75	14,919.67
Total	2,071,291.29	1,941,503.48
Daily average	66,815.85	64,716.78

Daily average excess of shipments over runs:

April, 1888	20,207.30
March, 1888	24,089.76
February, 1888	32,303.61
January, 1888	37,753.05
December	43,271.79
November	43,863.54
October	21,078.16
September	10,502.53
August	8,973.79

NET STOCKS.

PIPE LINE.	March 31, 1888.	April 30, 1888.
National Transit	23,579,711.45	23,164,076.52
Tidewater	1,188,179.57	1,124,879.85
Octave	2,530.81	1,790.52
Pittsburg	131,052.97	132,223.66
Southwest Penn'a	293,926.53	190,957.06
Western & Atlantic	59,601.40	81,399.12
Macksburg	382,528.95	388,707.54
Total	25,637,531.62	25,084,034.87

Net stocks decreased:

April, 1888	553,496.75
March, 1888	696,146.48
February, 1888	892,691.77
January, 1888	1,130,703.67
December	1,300,415.55
November	1,249,321.18
October	482,993.39
September	293,299.48
August	284,874.16

	Runs.	Shipments.
Daily average, April	44,509.48	64,716.78
Daily average, March	42,726.09	66,815.85
Daily average, February	43,187.46	75,491.07
Daily average, January	36,700.18	74,453.24
Daily average December	41,917.59	85,188.38
Daily average November	50,160.32	84,023 86
Daily average October	63,486.36	84,564 52

Searching for Oil Near Vladivostock.

Among the frequent visitors to the Petroleum Exhibition that has just closed at St. Petersburg, were the Ministers of Marine, Crown Domains, and Railways. All three were deeply interested in the display of liquid fuel appliances, and the and the result of that interest has been the assignment by the Russian government of the sum of 80,000 roubles to promote the exploration of oil in the Amoor region. Last year several indications of petroleum were discovered in the country near Valdivostock, and we drew attention to the importance of these at the time. The determination of the Russian government to construct a railway from Vladivostock to the Amoor renders a supply of fuel still more essential: and coal being scarce and bad, it is obvious considerable significance attaches to the discovery of fuel. But perhaps the chief motive lying at the bottom of the sanctioned expenditure of so much money is the desire at no distant date to use liquid fuel exclusively on board the Russian vessels running between the Black Sea and the Pacific. In the Black Sea a copious supply is already available, not only at Batoum, but also at Novorossisk, which taps the Kuban oil region; and again at Kertch, where several wells are being worked. Men-of-war, as well as mercantile steamers, could thus even now replace coal with liquid fuel in the voyage from Odessa to Vladivostock. What Russia is anxious to secure is a supply of local oil at Vlapivostock that will enable steamers to be equipped for the return voyage. If that were done liquid fuel would be adopted for the Black Sea and Pacific at once. To promote the discovery of petroleum in the Pacific region the Minister of Crown Domains is therefore sening out Mr. Ivanoff, a mining engineer trained at Baku, who will first examine the oil districts already known: and then search for petroleum in other localities. These operations will be watched with interest. —*Engineering.*

A NEW REFINERY.

PITTSBURG CAPITALISTS TO START ONE IN PHILADELPHIA—SHIPMENTS TO EUROPE.

THE Globe Oil Refining company will shortly start a large refinery in Philadelphia.

Some months ago the new refining company, whose main office is in Pittsburg, and whose directors are principally capitalists from the western part of the State, leased from the Girard Point Storage company their northermost plot of land, about 400x1,600 feet. This plot immediately adjoins the works of the Atlantic Refining company. Into the newly-acquired property of the Globe company run the Pennsylvania railroad tracks, on which all shipments to them will be made.

On the corner of the lot there is now building a large 95-foot tank to hold refined oil. Some distance from it is another tank of equal capacity for receiving the crude material. Between these two is another smaller tank. There are also four large ware houses on the property for the storage of refined oil that may be shipped to them in barrels.

From one large refining tank there will be run to the Schuylkill a pipe-line to load steamers with the refined oil. For this carrying trade, which it is proposed to bring to this city, and which the officials of the company predict, will be enormous in the next two or three years, the company is having remodeled a number of steamers. They will be built exclusively for this use and will have great tanks in their holds. Several of the large steamers now running between Bremen and New York carrying the crude oil in bulk will, it is stated, be chartered. It is understood that several large contracts have been made with European firms although the officers of the company decline to confirm this. The Pennsylvania railroad will, it is reported, control the handling of oil for the new company. Just how soon the new concern will begin business is not known. The President is Peter A. B. Widener, the Secretary is Edward Houston, and the General Manager, E. P. Reighard, all of Pittsburg.

IT IS THE NATIONAL TRANSIT

WHO ARE THE VICTIMS OF A ROBBERY OF OIL FROM A TANK IN MEAD TOWNSHIP.

DURING the present month the Standard press has had long accounts relative to alleged thefts of oil that certain parties had been making from time to time. This is what the Standard's *O. P. & D.* weekly has to say:

"A furore of excitement has been experienced in Warren and the neighboring borough of Clarendon, that has been seldom equalled by any event in the history of that section of the oil country arising from like cause. The flutter grew out of the arrest last Tuursday of J. R. Timmons and R. D. Scott, both of Clarendon, on a criminal warrant charging them with the larceny of a large quantity of crude oil from a tank owned by the National Transit company, and located in Mead township, near the west end of Clarendon borough. The warrant was issued by George O. Cornelius, a Warren justice of the peace, at the instance of Nelson Moore, superintendent. Timmons is the manager of J. R. Timmons & Co.'s Cleveland oil works, an independent refinery at Clarendon. The works were established there some five years ago. Scott, the other defendant, was, until the hour of his arrest, an employe of the National Transit Company, and had charge of the loading rack adjacent to Timmons' refinery. It is charged that collusion existed between the two parties by which some 1,400 bbls of oil, valued at $1,232, was run from the tank No. 1,353 into tanks owned by the defendant Timmons, and for which the National Transit company received no compensation.

The prisoners were taken before Justice Cornelius for a preliminary hearing, charged with larceny. On opening the case, counsel for the defense received a setback, when the defendant, Scott, surprised his friends by entering a plea of guilty. Mr. Timmons pleaded not guilty, bail being required for each defendant in the sum of $2,000. C. C. Campbell, of Clarendon, furnished the necessary bond for the appearance of Timmons at the time designated by the court, but Scott, being unable to procure bail, was transferred to the custody of Sheriff Love and taken to the county bastile.

When the curtain rolled up on the next act in 'Squire Cornelius' cosy court room, the performers were confronted by a full house. It had been rumored that Scott would withdraw his plea of guilty and demand a hearing, but this idea was dispelled soon after the opening of court. The first witness sworn was B. E. Mitchell, a foreman in the employ of the Transit company. On the 21st of April Mr. Mitchell went to tank 1,353, and found that the pole showed 12 feet 6¾ inches of oil in the tank. The following day he took the pole out of the tank and discovered that nine feet had been sawed from the bottom of the pole. April 23d he made another examination, and found that the pole was still shrinking. It was seven feet shorter than on the occasion of his last visit. The witness further testified that the capacity of the tank in question is 85 bbls to the inch, and that Scott had charge of the loading rack, no other person having authority to load cars previous to discovery of the shortage. The oil is run from the tank to the loading rack through two 4-inch lines, and from one of these a 3-inch line connects with Timmons' refinery. The latter line, however, had not been in use for a year, and witness took out the connections about two months ago. Scott carried the key of the lock to the branch lines.

Captain Moore: the National Transit company's superintendent for this district, testified that his attention was called to the fact that a shortage existed at No. 1,353. He took a gauge of the oil only 5 feet, 4¾ inches, whereas Scott had reported 6 feet, 9½ inches, or a discrepancy of 16¾ inches of crude, at 85 bbls. per inch. The oil could not be taken without Scott's knowledge.

R. D. Scott, was then placed on the stand. He swore that it was his duty to load oil on cars by order of Mr. C. Simpson only, but acknowledged that he had loaded cars for Timmons without authority from his superiors: had loaded 12 or 15 cars for Timmons within a year and cars had been shipped wherever Timmons directed. When Timmons wanted oil, Scott would load it in tank cars for him, receiving pay for the oil (at what price was not found out) after each transaction.

This concluded the evidence for the commonwealth and Lawyer Higgins made a strong plea in behalf of his client, in which he sought to convince his Honor that sufficient evidence had not been adduced to warrant the court in holding the defendant, Timmons, for trial. He argued that not a scintilla of evidence had been brought forward which tended to prove that Timmons was guilty of the crime of larceny. He had purchased the oil from Scott, and had paid for it. The only charge, therefore, that there was a possibility of sustaining against Timmons was that of receiving stolen goods, and to establish even this a guilty knowledge must be proven—and, in the opinion of this counsel, there was no evidence of a guilty knowledge that Scott had sold oil that he did not have a perfect right to sell.

Mr. McSweeney, for the commonwealth, took a decidedly different view of the case. He argued that it was not necessary for the commonwealth, at a preliminary examination, to establish anything further than that a crime had been committed and that a strong probability existed that the accused was implicated in the commission of that crime. Mindful of this fact the prosecution had not deemed it necessary to bring out the minor details of the case, but an opportunity would be given latter for both sides to have a full hearing in the manner prescribed by law, and when that time comes the exact grade of the defendant's offense will be clearly established. The evidence here shows that oil has been stolen; it has been traced to the defendant's tanks, and the law holds the fact to be strong presumptive evidence that the defendant is a party to the theft.

'Squire Cornelius adjusted his eyeglasses, took a ponderous legal volume down from its shelf, turned deliberately to a famous passage that he always keeps marked for references, and read something like this: "And where the evidence is of such a character that a doubt remains as to the guilt or innocence of the accused, it shall be the duty of the magistrate to commit the defendant for trial." The court continued: "I must say that a grave doubt exists in my mind regarding the guilt or innocence of Mr. Timmons. It would seem that the defendant's acquaintance with Scott was sufficiently intimate that he might be expected to know something of the latter's circumstances, and his ability to honestly sell oil in such quantities, and I accordingly hold Mr. Timmons to bail in the sum of $1,000 for his appearance at court on the first Monday of June."

Mr. Timmons secured a bondsman in the person of Mr. A. J. Hazeltine, cashier of the Warren Savings Bank, while at last accounts Scott was still in the hands of the sheriff.

During the progress of the examination the intimation cropped out that the defendant will endeavor to refute the "guilty knowledge" theory by evidence showing that Scott, while acting in the capacity of agent for the Green Line, had frequently made small sales of oil to Mr. Timmons from the cars of this line, said cars being popularly supposed to be empty, while it was not unusual for a single car to contain fifteen or twenty bbls of oil after a load had been transported to some distant refinery and the cars returned. The defense will claim that the few barrels of oil thus remaining in those cars was not the property of the National Transit, and as it was a part of Scott's duty to clean the cars before having them refilled it was the most natural thing in the world for him to earn an honest dollar by selling the "dippings" to some convenient refinery. If we follow out this theory, it will be seen that Scott became avariciously inclined and increased his revenue from "dippings" by drawing from the large tank and falsifying his reports, while Timmons continued to purchase in blissful ignorance.

But, as a material offset to the claims of Timmons and his friends, it may be in order to cite the opinion of Captain Moore, who has doubtless loaded as many cars as any man connected with the oil business. This gentleman says that during his varied experience he rarely found more than a few gallons of oil remaining in a tank that had been emptied, and never more than 15 or 20 gallons—not barrels, as claimed by the other side.

Heavy Oil.

The following heavy oil notes appeared among the Galloway and Sugar Creek items in the Franklin *Citizen-Press* this week:

Algeo & McGinnis are erecting a bandwheel pumping rig on the Patterson farm.

Keely & Co. are putting down a well on the Galloway tract.

Jacob Sheasley is drilling a well on the Phillips farm.

Daniel Grimm is putting up another rig on the Evans tract, and will begin drilling soon.

The Standard Oil Company are cleaning out an old hole on the Smith farm.

Jacob Sheasly is building a bandwheel pumping rig on the Carter farm.

Richard Hancock broke the ground for another well on the Hall farm Saturday.

The well on the Grimm & Fetteroff lease is good for four or five barrels.

The well on the Robinson & Sheasley lease is a small producer.

The Southwest Penn.

Following is the report of the Southwest Pennsylvania Pipe Line company for April: Gross stocks, 229,454 barrels; total liabilities, 190,957; runs from wells, 124,575; regular deliveries, 21,850; other deliveries, 205,694. This is a decrease of 11,081 barrels in runs, 102,909 in total liabilities, and 96,544 in gross stocks, and an increase of 7,430 in regular and 16,121 in other deliveries.

THE PETROLEUM AGE.

DEVOTED TO THE INTERESTS OF THE PETROLEUM TRADE.

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CURRENT COMMENTS.

THE green hills make the active producer long to put the drill in motion.

***

WHAT tales of romance, disaster and ruin these unsightly derricks could tell if tongues were only given them.

***

THE Senate's investigations of Trusts has become a store-house of evidence for all suits for rebates against the Pennsylvania railroad.

***

ANOTHER rumor comes from the land of Zoar that oil has been found. It probably will cause some talk for a time and then be forgotten the same as on former occasions.

***

AN exchange states that at Florence, Col., there are twenty-one producing wells, yielding about 800 barrels of crude petroleum per day. Unless something more startling than that is circulated, the Eastern markets will not be seriously affected by Western rumors.

***

A SERIES of experiments have been conducted at Bombay, India, with an apparatus for the manufacture of gas from ordinary illuminating oils. The gas was made by mixing cocoanut and castor oil with the petroleum, and it is claimed that one quart of oil will make sufficient gas to supply a light of thirty-five-candle power for five or six hours.

***

IN one case, at least, the cause of the people against a monopoly has been successful. For a long time the city of Rochester has been waging war against the Bell Telephone company because of some stringent exactions demanded by that organization. The result is that the people are victorious, and the company will hereafter carry on its business on a basis prescribed by the city authorities.

***

THE refusal of the Philadelphia Gas company, of Pittsburg, to make any new contracts for furnishing natural gas for a longer period than thirty days is exciting much comment. At first the reason for this act was supposed to be the lack of pressure. This the company has emphatically denied. In place of this very plausible excuse they have put forward the very flimsy reason, that on long contracts questions are constantly arising between the company and consumer that often place one or the other at a disadvantage or loss; consequently, in justice to both parties, they have decided to make this change. Why did not the company come out and say what they meant—that it was an increase in rates that they were determined to have?

***

THE letter of the Executive Committee of the P. P. A. tells its own story. It will have more interest than the best story that was ever written, and is as encouraging as a friend in a dark hour. The work goes bravely on, and there do not seem to be any stragglers in the well-organized oil army who have passed the Rubicon and have all that is bright before them.

***

THE burning of the oil in the large iron tanks near Oil City made a beautiful pyrotechnic display, but on account of the imminent danger to the citizens of that city they were unable to watch the rolling smoke and leaping flames with as much admiration as they would if they were farther away from the scene. The caged leopard draws many admirers to him, but let the spotted monster loose and the multitude forgets the beautiful markings of nature and seeks safety.

***

AT last a Russian petroleum syndidate has been formed which may prove sufficiently powerful to control the operations and prices of the market in Russia, and perhaps in other portions of the world. The moving spirits of this syndicate are said to include Nobel brothers, the Paris Rothchilds and N. J. Ferner. The monopoly has already secured the Atlantic wharf from the Atlantic Storage company, and also purchased the St. Andrews wharf at Millwall, which they are preparing for the storage of petroleum in the most perfect way possible. Now let the powerful hand at 26 Broadway be extended across the ocean and the world will be at the mercy of the combination.

Indianapolis Gas Trust.

Superintendent Shackelton, of the Consumers' Gas Trust company, has recovered from his illness and is again at work on the several enterprises that demand his supervision. The contractor for the main line is making rapid progress. The second test is being made to-day and nearly half of the line is completed. All of the branch lines which empty into the sixteen-inch main are in the ground, and to-day's test included a portion of the sixteen-inch pipe. Many of the friends of the Trust realizing the importance of encouraging the enterprise at this time, are anticipating the assessment which falls due next Monday.

"There has been no delay in our work," said one of the directors to-day, "more than circumstances made absolutely necessary. When the council gave us permission to lay pipes inside the city we had not a line of specifications necessary completed. We could not take bids until we had specifications, and for 20 miles of high pressure pipe (not to speak of the low pressure lines) not a little office work is necessary before a spade can be handled. Then the superintendent was sick for a week. But now the way is clear. The specifications were completed on Saturday; were immediately advertised, and six contractors have procured copies of the specifications and are going through the details preparatory to giving a safe and intelligent estimate of the cost. By the middle of next week I think the bids will all be in and arrangements for digging perfected. We want to make all possible haste, but we would not be sustained if we should proceed without giving opportunity for competition and without plan or method."—*Indianapolis News.*

IMPORTANT GAS QUESTION.

PROCEEDING TO TEST THE CHARTERS OF ALLEGHENY COMPANIES.

THE raising of natural gas rates to consumers in Allegheny is becoming a very serious matter, not only to the subscribing though protesting citizens, but to the companies also, it would seem, says the Pitsburg *Dispatch*. The culminating movement to resist the rate raisers was very quietly, but very determinedly, inaugurated yesterday. Lawyer A. H. Mercer was found in his office early in the afternoon, busily preparing the resolution for presentation in the Allegheny Common Council. "This," said he, "is only the culmination of the feeling aroused in Allegheny over the action of the gas companies in putting up their rates regardless of everything. I am in the Allegheny Councils, and to-night the point will certainly be reached, if feelings expressed beforehand go for anything.

"The citizens and Councils have been working in unison, and are meeting every Friday evening until the thing reaches a climax. Considerable money has already been subscribed in view of legal prosecution, and this will furnish a test case that will be of value to every city and town in the country using natural gas. The ordinances of Allegheny City are very strong on the point of consolidation of gas companies: also, the limitations in regard to their charging reasonable rates, are very stringent.

"I do not know that the Pittsburg ordinances cover these important points, but if they don't, they should. However, a case in equity will always stand, whether city ordinances cover the situation or not. The Allegheny movement is a blow toward the Philadelphia Company, as it owns a majority of the stock."

Another well-known legal gentleman, who is conversant with the Allegheny affair, was found. "The key to the whole situation," said he, "is found in the act of Assembly of May 29, 1885, under which all of these gas companies are chartered.

"This act says plainly: 'Natural gas is for public use.' This means that the companies cannot say to the consumer: 'Here, you must have our gas and we will charge you just what we please for it.' Cities may pass such ordinances as they please, and these ordinances may be fathered by the gas companies, or they may not: but they won't hold in an equity suit, for the act quoted covers the case." Continuing, the same gentleman said:

"Everybody would be shocked if the Pennsylvania railroad were to charge a certain man $100 for carrying him to Philadelphia, just because they found out he had to go: but that is just what the natural gas companies are doing. There would be a suit at once if the city tried to charge a property owner one cent more than was just. But the trouble has been, that no one individual cared to enter a suit against a corporation, even if the corporation had overstepped the bounds of the act under which it had been chartered. I understand the Allegheny gas question has come to a point, and I

would respectfully call the gentlemen's attention to the act referred to. Everybody seems to have overlooked it heretofore, and I am surprised that they should, for, as I said before, it furnishes a key to the solution of the whole question. The moment a corporation handling something for the public use charges an extortionate price for that commodity or article, that moment they are laying themselves open to damages in an equity suit, besides the danger incured in regard to a forfeiture of charter, as in the Allegheny case."

When the great issue was sprung in the Allegheny Common Council, it was Councilman A. H. Mercer who started the ball rolling by offering the following resolution:

WHEREAS, It is alleged by various citizens of Allegheny, who are consumers of natural gas supplied by the Allegheny Heating company and the People's Natural Gas and Pipeage company, that those companies have raised the price of gas for private houses to sums that are unreasonable and unjust; and, second, that the People's company has raised the price of gas for private houses to sums in excess of the prices stipulated in section 9 of the ordinance regulating the manner and fixing the terms and conditions for the supply of natural gas to consumers, passed February 12, 1886; and

WHEREAS, It is alleged that the Allegheny Heating company and the People's Natural Gas and Pipeage company have entered into a contract, granting, conveying, leasing, assigning or transferring, either directly or indirectly, the rights granted to the People's company to the Allegheny Heating company, in such manner as to place the power under the ownership and management or control of the latter, contrary to the provisions of section 12 of the ordinance passed February 12, 1886; therefore, be it

Resolved, By the Select and Common Councils of Allegheny, that the Committee on Natural Gas is hereby authorized, empowered and directed to investigate these charges and make reports to Councils of the facts and the testimony; and, for this purpose, they are hereby authorized to summon parties, witnesses and papers before them, and to take testimony undes oath of the witnesses, at such public sessions as the committee may determine. allowing the attorneys of the gas companies and the attorneys of the committee of citizens to be present at all sessions, to examine and cross-examine when thought proper, the manner of taking such testimony and the admissibility of evidence to be under the control and direction of the Committee on Natural Gas.

Resolved, That at any time during the progress of the taking of testimony, should the Committee on Natural Gas so determine, the City Attorney shall proceed against the companies, or either of them, in the courts for a forfeiture of ordinance and the protection of the city or its citizens.

Resolved, That the committee make a report as soon os practicable.

An amendment referring the resolutions to the Natural Gas Committee without the indorsement of Councils was lost, and the original motion, offered by Mr. Mercer, prevailed.

Suing a Railroad.

Taking of testimony has been begun before United States Commissioner Geo. A. Chase, at Titusville, in the suit brought by Rice, Robinson & Witherop, independent refiners, against the W. N. Y. & P. Railroad company before the United States Interstate Commerce Commission, for alleged excessive freight charged. George Zabriskie, Esq., of the law firm of Burrill, Zabriskie & Burrill, of New York, represents the defendants. and M. J. Heywang, of Titsville, the plaintiffs.

Petroleum Springs In Asia Minor.

On the eastern side of the Tigris, in the neighborhood of Kerkook, are numerous petroleum and naphtha springs which furnish employment for many of its people. The most abundant supply is obtained from the hills around, but a good deal is collected on the surface of the water in the ditches and stagnant pools. Some years ago this petroleum was largely used in Bagdad and Bussorah, but as the natives do not understand how to refine it properly, it has of late years been superseded by Russian and American oil. If the proper scientific methods were used in refining it, it is probable that the oil from this region might become of great commercial importance, as it is inexhaustible in quantity, and even without a railroad transportation is easy by way of the Tigris and Persian Gulf to Bagdad, Bussorah, India and beyond. There is, it is said, no limit to the supply which might be procured from the hills about Kerkook and Arbela. These hills have been yielding bitumen and petroleum since the time of Alexander the Great, at least, in whose honor Arbela was illuminated after his great victory over the Persians.

The petroleum springs form in almost every hollow in the hills. It it very greasy to the touch. As it rises from the earth it of a brownish color with a greenish tinge. It quickly becomes opaque and hard, in which state it is easily broken, with a shining resinous fracture. The natives use it for fuel to burn limestone, and also to cover boats with. The boats which are covered with this substance look as if they were covered with a thick hide. Mr. Grattan Geary, to whom I am indebted for these particulars, thus describes the principal spring, a funnel-shaped hollow. ten or twelve yards in diameter: "The hollow is filled with a dark blackish brown substance, from the centre of which salt water bubbles up and escapes to some salt ponds. where, evaporating, its saline matter is left behind. Sometimes the water rises at intervals from the center in jets a foot and a half high, and at others it bursts out in a considerable volume, raising the petroleum into huge bubbles, which burst and let the imprisoned water out with a gurgling noise. The pit is very deep in the centre, but its shallowness at the edges permits the people to stand in it up to their knees, while they with facility roll up the tenacious substance into masses, which are carried away and placed to dry in the heat of the sun. When hardened it is used chiefly for fuel for the burning of limestone. The flames give a strong light and heat and it leaves a small earthy residue after it is burned. Notwithstanding the quantity that is constantly drawn off, the petroleum always continues at the same level and the Hitties say the supply in the pit is inexhaustible. The fluid skimmed off the water in the ditches and marshy places in the neighborhood of Kerkook is of a blackish green color and smells abominably."—*H. M. Jewett, Consul.*

A FIERY TERROR.

A GAS WELL IN INDIANNA THAT COULDN'T BE PUT OUT.

THE city of Anderson, Ind., and the country for miles around, as well as two railroad companies, namely, the Panhandle and Cincinnati, Wabash and Michigan, is in a state of excitement bordering on the frantic, regarding what is known as the brick works gas well, two miles north of here, at the crossing of the two railroads named. Some time since the contract for drilling a gas well at that point was awarded to A. Cole by Clemens & Jones, proprietors of a mammoth brick burning plant. The drill went down to about the usual depth at which gas is struch in that locality—850 feet—when it touched Trenton rock. An odor of gas was at once detected, and the drill kept moving. When it had penetrated the Trenton stone about two feet it suddenly dropped about six feet into what appeared to be a cavern or hollow place in the stone. The machinery was reversed and began hauling the big 1,900-pound drill from the well. When it had been raised to a point which brought the lower end of the drill above the cavern below, the terrific pressure from below shot the drill and shaft upward and out through the top of the derrick like an arrow. The workmen were awe-struck and fled for their lives. The big drill in falling smashed the derrick house and partly wrecked the derrick. The roar of the escaping gas is simply appalling, but was not considered dangerous, although a school a short distance away had to be dismissed on account of the dreadful noise made.

Things remained this way a few days, the contractors and owners of the well consulting as to what would be the best method of harnessiug the monster. Sunday evening, however, before they had agreed upon a plan, the gas was accidentally fired by a passing train, and since then a flame fully 250 feet high and 100 feet in diameter at the largest point has been roaring from the month of the eight-inch pipe. The noise made is almost deafening and causes the earth to tremble.

The proprietors of the well are now in still greater trouble. The well being near the crossing of the two railroads, the wind laps and bends the big flame across them, burning trees and warping rails. In addition to this trouble, it is dangerous for a train to pass the burning well for fear of being set on fire. Several passenger coaches on the Cincinnati, Wabash and Michigan road have been nearly ruined, while almost every freight train which attempts to pass is set on fire. Men are now busy laying temporary tracks around the big fire, and the railroad companies are threatening damage suits against the owners of the well.

A reward of $300 has been offered to anyone who would extinguish the blaze. Several excursions from Indianapolis, Wabash and Muncie, where they have little or no gas, have been run to the burning monster.

Lima Oil in Chicago.

Lima oil is being rapidly introduced into Chicago as fuel, and a much greater demand for it is looked for when the Standard's pipe line shall be completed. The Ohio oil fields are at present producing 25,000 barrels a day, and the Union Steel Works are using of it 1,000 barrels a day, when they formerly used

400 tons of coal. They have not entirely abandoned the use of coal, but it has almost been supplanted. In these works it requires sixty-five men less to do the work than with coal. This saving of labor is in firing, hauling ashes, etc. The item of ashes is quite important to such a large concern, as they remove them outside the city. No figures are given as to the relative cost of coal and oil based on actual experience. The insurance people were at first bitterly opposed to the use of oil, but the oil people were able to demonstrate that oil fuel did not increase the risk, and they expect in good time to overcome the prejudice. They are meeting with about the same opposition in this particular that had confronted the electric light companies. The Board of Underwriters is investigating, and is expected to report soon.

C. B. Matthews on the Stand.

C. B. Matthews of Buffalo, engaged in refining and selling oil and manufacturing illuminating and lubricating oils since 1881, was called before the House committee on manufacturers, at Washington. The capacity of his works, he said, was from 1,500 to 2,000 barrels of oil per weer week. He was a competitor of the Standard Trust. Witness detailed at length the difficulty he experienced in getting crude oil at reasonable rates, owing to the friendliness of the various transportation companies to the Standard Trust.

The witness detailed the circumstances connected with the indictment of five officials of the Standard Oil company in September, 1885, on a charge of conspiracy and bribery of one of the witnesses to blow up his still.

To Representative Smith witness said that $60,000 was demanded by members of the Buffalo Common Council of witness and others for a charter to supply Buffalo with natural gas. The charter was afterwards granted to the Standard Oil people.

"Is that the usual method of getting franchises," was next asked.

The witness's reply was: "I understand it is necessary to furnish an inducement to get any valuable franchises."

"What did you do after that?"

"I think we subsided about that time."

H. S. Depew and George Lyatt of the Mobile & Ohio railroad company produced a statement of the rates and amount of oil carried by their line. Mr. Depew said that the Mobile & Ohio road always had charged the same rates for 100 pounds on oil whether shipped in tanks or barrels.

Malcom Lloyd, a Philadelphia oil refiner, who was said by testimony to have received rebates from the Pennsylvania railroad along with the Standard Oil company, asked to be excused, and finally declined to produce a statement giving the amount of these rebates. He admitted receiving rebates and thought that was as as much as should be asked of him.

Harrisburg's Test Well.

The test well being drilled for natural gas by Harrisburg capitalists on the Coover farm, three miles west of the city, is shut down for reasons best known to the parties interested. When the *Telegram* representative visited the well he found the derrick effectually closed and pad-locked to all comers. The well has been temporarily deserted by the drillers who have urged the drill to a depth of 1,200 feet. A glance at the sediment sand-pumped from the well shows a quantity of blue and red slate and gray sandstone, such as are commonly found below the level of the sea. As yet there are no signs of oil or gas and the well is dry. Deeper drilling will tell the tale whether the enterprising projectors are to be rewarded or not. There is absolutely nothing to indicate the test well will ultimately prove an absolute failure as such a condition can only be demonstrated by unanswerable developments of the drill.—*Harrisburg Telegram.*

Dangerous Russian Oil.

Recently, in the House of Commons, Mr. Lafone asked the Home Secretary whether petroleum was now coming in bulk from Russia, in tank steamers right up the Thames as high as the Regent's canal-dock, these vessels discharging with fires alight on board, frequently working night and day; such steamers often carrying upwards of 12,000 barrels, so little precaution being exercised in the river that two steamers went into one of the up-town docks lately with inflammable oil in barrels below 73 degrees Fahr., and stored the oil on the quay; and whether he would take immediate steps to bring in a bill to regulate the storage of petroleum, Mr. Matthews replied that adequate arrangements were made for the safe conveyance and storage of these oils. Diligent inquiries had failed to elicit any such cases as were referred to in the question, and careful examinations and tests were periodically made of the samples by the officers of the Metropolitan Board. Only one instance had been discovered of oil flashing at 74 degree Fahrenheit, and none below 73 degree having been sent up the river. A bill for the purpose of further regulating the storage was in course of preparation, and he hoped would be introduced this session.

An Engine Man on the Shut-Down.

E. W. Parshall, agent for the Warren Oil Engine company, passed through the city on his way to the Washington oil field. Probably no one man travels so much along the oil belts and has such an intimate acquaintance with the contractors and drillers, and for this reason Mr. Parshall's opinion on the shut-down movement should have some weight, as he spends every hour in the oil fields from New York to Ohio.

"Of course the shut-down has hurt my business, but we are content to hold our own until the change occurs," said he. "We all recognize it as a good thing, and the man who knows the most of the ins and outs of the legitimate producing business is the man who is most enthusiastic in advocating the shut-down. I know myself that men who at first fought shy of the combination are not only going in every day, but taking their friends along with them. I think that the association will be satisfied with reducing stocks down to about 15,000,000. Indeed, they hardly dare go further than that, because it would actually make things dangerous on the other side. The Standard would hardly consent to a lowering of the stocks below 15,000,000 to 18,000,000, and it is perfectly amazing to the old heads to see the gauge moving down toward that point. They never thought it possible that such a thing could be done and I am convinced that the association is astonished at its own success. In the oil business there has never been such a successful move and the speculators will be lucky if it don't turn into a squeeze. It is a success, if it bursts to-morrow, but its most sanguine opponent must admit that it is stronger than ever. The lines have been drawn so tight that they cannot be loosened all at once. I look for a gradual letting down and tapering out of the shut-down that will not be felt in the field or in prices. Then, of course, my business will boom." and Mr. P. lit another cigar and calmly gazed through its blue smoke to the future when one of his engines will be used to drill through the earth and tap the Russian field from this side of the world.—*Pittsburg Dispatch.*

Natural Gas Notes.

During the past year Kokomo, Ind., by the development of natural gas has secured ten manufacturing establishments with an aggregate capital of $1,240,000, employing 1,610 workers. During the same period, Marion, Ind., has secured eighteen factories in all capitalized at $655,000, giving employment to 1,010 workmen.

A new gas well which has been drilling at Findlay, Ohio, for the use of the newly located glass factories recently secured for that place, came in on last Monday with an an estimated flow of 8,000,000 cubic feet of gas per day. As this well was drilled in territory not heretofore tested, there is much satisfaction over the result.

The gas well recently struck on the Abbott farm fourteen miles south of Wabash, Ind., is perfectly dry and showed a strong flow at five feet in the Trenton rock, which was tapped at a distance of nearly 1,000 feet from the surface. The find practically assures gas in abundance for Wabash, as the syndicate which is to supply that city with gas has several farms leased in the vicinity of the new well and will begin drilling there at once.

An effort is being made to induce every consumer of gas from the Wheeling company's lines in this city, Bridgeport and Martin's Ferry to enter into a joint agreement not to take gas after the present contracts expire if there is any advance in rates. If natural gas cannot be found about here after a thorough test then another company will be induced to pipe it here or a company will be formed to manufacture gas under the Westinghouse patents.—*Bellaire Independent.*

The Bridgewater Gas company has just leased all of the gas wells belonging to the Economite society for a term of one year beginning on the 18th inst. The consideration on which the lease was obtained was not learned, but is said to be highly satisfactory to both parties. The lease includes four or five good wells which will be connected with the Bridgewater mains as soon as the necessary pipe line can be laid.

That Buffalo Franchise.

Very significant was the testimony given by Mr. C. B. Matthews, of Buffalo, before the House Committee on Manufactures. It is not new as bearing upon the franchise asked for to supply Buffalo with natural gas and the grip which the Briarean-armed Standard Oil company has upon that unfortunate city. The transaction has been quite thoroughly exposed by the Buffalo papers,

especially by that staunch foe of corruption, the Buffalo *Express*. Rochester is not singular in the clutch which this greedy corporation has upon those who are ostensibly elected to preserve the lives and property of its citizens, but who "come down" at its bidding as readily as the coon descended the tree at the behest of Capt. Scott's gun. The Buffalo problem seems to be, if the Common Ouncil demanded $60,000 for a natural gas franchise and didn't get it, how much did they realize from their negotiations with the rich and benevolent Standard Oil corporation? The Rochester problem is simpler, as not involving such large figures as factors therein.—*Rochester Democrat.*

THE EMERY SUIT.

TESTIMONY AS TO THE REBATES PAID BY THE RAILROAD.

TESTIMONY was taken this month before a commissioner appointed by the court of McKean county, at Philadelphia in the case of Logan, Emery & Weaver against the Pennsylvania Railroad company to recover $321,000 for damages and excessive charges on shipments of oil from December 1, 1881, to January 1, 1887. The testimony thus far taken is damaging to the railroad. Under the act of 1883 triple damages are recoverable where discrimination in freight rates are proved. During the six years mentioned the plaintiffs claim that they were overcharged $76,653.90 in the shipment of crude oil, and $30,466.80 in the transportation of refined oil, aggregating $107,120.70. They are now sueing to recover damages in three times that sum.

When the commissioner was at Titusville recently, taking testimony, the plaintiffs proved the payment of 13 cents per barrel rebate to the Standard Oil company on the shipment of refined oil. That fact was established by the evidence of J. W. Witherop, of the firm of Rice, Robinson & Witherop; Frank L. Wood and John Schwartz. Mr. Witherop made a demand upon the Pennsylvania Railroad company for $3,600, the amount his firm had been overcharged at the rate of 13 cents per barrel for refined oil, and the company complied with the request. Mr. Wood likewise made a demand for the return of 13 cents per barrel upon all shipments made by him between 1882 and 1884, and he obtained the money. Mr. Schwartz recovered $1,766 in the same manner from the Pennsylvania Railroad company.

On the 3rd inst. the plaintiffs called Mr. Malcolm Lloyd, treasurer of the Atlantic Refining Company, a branch of the Standard, to prove that rebates had been paid to him by the Pennsylvania Railroad company in the shipment of crude oil. Mr. Lloyd refused to answer the questions put to him by the counsel for Logan, Emery & Weaver, until he had consulted his counsel. When he appeared on the stand next day Mr. Lloyd freely admitted the payment of rebates to him by the Pennsylvania Railroad company while he was operating an independent refinery at Gibson's Point. He said that from 1881 to 1884 the Pennsylvania Railroad company had paid him rebates upon the shipment of crude oil from Olean to Philadelphia which ranged from 3 to 28 cents per barrel. These payments were not continuous, as there were several intervals during which he was not allowed any rebates. A most surprising statement made by the witness was that the Pennsylvania Railroad company made him a present of $3200 in 1886 to cover losses in his business for the years 1884 and 1885. He said he went to the officials of the Pennsylvania Railroad and represented to them that he had lost $10,000 during those two years. The company presented him with a check for $3200. He stated further that Messrs. Cassatt, Thompson and Wilson were acquainted with the payment of these rebates, as he had talked with these officials about the matter. The payment of the rebate of 28 cents per barrel lasted for two months during 1882.

The remainder of the session was taken up in proving the amounts of shipments made by the plaintiffs.

The hearing before Commissioner Broadhurst in the suit of Logan, Emery & Weaver against the Pennsylvania Railroad was resumed the 5th inst. at No. 210 South Fourth street, Philadelphia. H. Y. Arnold, the firm's superintendent, under cross-examination testified that the firm did not receive any rebates from the railroad in 1883, but that it did during the succeeding four years. He said that the firm on September 20, 1883, received a sum of money from the railroad company, but declared that it was not in the nature of a rebate, but a "refunder" for overcharges. He could not call dates upon which bills were sent to the railroad company to have rebates deducted from them.

The day was taken up by the examining of bills and receipts showing the shipments of oil to the firm. The counsel for the railroad endeavored to show that rebates had been paid to Logan, Emery & Weaver.

An unusual feature of the hearing was the attempt of J. Ross Thompson, one of the railroad attorneys, to examine Mr. Arnold as to the contents of certain bills that he held in his hands, without permitting the witness to see them. The hearing was concluded in the afternoon, although all the testimony in the case had not been received, as the rule expired that day. Application will at once be made for a rule to continue the case.

Putting on Another Screw.

The Standard people are evidently determined to invalidate as many of the Manufacturers' Gas company contracts as possible during the summer months. This is probably done because during the summer consumers are more liable to neglect their payments. A short time ago the company sent out the following notice:

You are hereby notified that unless your gas bills are paid in advance, before the 10th of each month, according to contract, the same will be canceled and regular rates charged thereafter.

THE MANUFACTURERS' GAS CO.

As is quite natural in such cases, a great many deferred making the payment until to-day, the 10th., which they supposed was the last day allowed for the payment. But when they went to the office the fact was pointed out to them that the slip stated the payment must be made "before the 10th." They at first refused to receive the money, but the kicking was so vigorous that they finally conciuded, we believe, to take it.

The original agreements, which the company is now anxious to cancel as fast as possible, contained this clause: "Bills payable at gas company's office in advance before the 10th of each month." But subsequent to this the company gave notice through both the city papers that bills were payable at regular rates any time before the 30th of each month. In most branches of business the sellers are satisfied if they get their pay promptly upon the delivery of the goods, but the Standard gas company, which pays the well owners the magnificent sum of $100 per year for wells, must have its pay from consumers in advance. And they are not satisfied with payment twenty days before the gas is delivered. They must have it twenty-one days before. In other words, if paid on the 9th it will answer; but not on the 10th. Sweet-scented are the practices of monopolists.—*Oil City Blizzard.*

Searching For Gas in the West.

The search for natural gas in various parts of the West goes bravely on, but with little success. The well at Carthage, Mo., has been abandoned after reaching a depth of 2,005 feet. Nothing of an encouraging nature was found. A well has been put down at Decatur, Ill., to a depth of 1,600 feet, with no indications of gas in commercial quantities. At Louisiana, Mo., a well was recently sunk with do better success. A deep well is now under way at Ft. Scott, Kas., where it is hoped a more abundant supply will be found than is now afforded by the present wells which are only 300 or 400 feet deep. In the vicinity of St. Louis several wells are now being drilled. Two of these are in the city—one by a brewing company and the other by a cold storage company. In both of these cases the primary object is to find an abundant supply of clear water, but their owners would not object to a large strike of natural gas. A St. Charles (Mo.) company have a well down about 1,500 feet, but report the discovery of nothing valuable thus far. The St. Louis Natural Gas and Oil company are drilling a test well for natural gas about nine miles west of the city. A depth of 1,000 feet has been reached. It is expected that the Trenton limestone will be reached somewhere between 1,400 aud 1,700 feet. Whether it will prove to be gas-bearing is an open question at this writing. Another well has just been commenced near Kirkwood, Mo., one of St. Louis' most beautiful suburbs.—*Age of Steel.*

The Philadelphia Gas Company.

The annual report of this company shows that the net earnings for the year ending March 31, 1888, (13.53 per cent. of capital) was $1,014,642.06, less dividends paid $842,626.50, leaving a surplus of $172,015.56.

The Philadelphia company owns 280 acres of gas lands, owns the gas rights of 2,194 acres and leases 46,078 acres. Through the Pennsylvania company and the Chartiers, in addition to what it has of its own, the company controls 74,269 acres. It owns 472 miles of pipe lines and operates a total of 654.17 miles. It operates 192½ miles of telephone wires and has 37 private telephone stations. It operates 112 wells of its own, 19 of the Pennsylvania company and 43 of the Chartiers company, a total of 173 wells.

The pipes which have been laid in the streets for the distribution of gas to dwellings will insure a large addition to the number of domestic consumers, but in order to supply this expected consumption, a very considerable addition must be made to the mains which sup-

ply these branches. There are 23,707 buildings supplied by this company. The treasurer says: "The prodigious growth of this business has caused the managers of your company to anticipate the time when they will be compelled to supplement the natural supply by the addition of manufactured gas, and they have united with the Fuel Gas and Electric Engineering Company, limited, of Pittsburg, in experiments to secure the best results, thereby acquiring for the Philadelphia company the right to the exclusive use of the Fuel Gas Company's system in Allegheny county."

OHIO IN APRIL.

A REVIEW OF THE OIL WORK DONE IN THAT FIELD.

IN a review of oil operations for the past month in Ohio the Titusville *Herald* correspondent writes: It is one of the surprising facts of oil region history that operations in Ohio are increasing under the pressure of 15 cent oil. Just how the trade can figure out even fair profits at such a price is a positive mystery to the inexperienced. But the question arises, do they do it? It is well known that considerable Pennsylvania money has recently found exercise in the Wood county of that field. Among the companies now quite extensively interested are the Forest Oil company, the Associated Producers' company, the Hazelwood Oil company, Roberts, McKay & Co.; Rockwell, Miller & Co.; T. J. Vandergrift & Co.; Tait & Patterson and others. These have been led to take up large bundles of territory for future use and are now doing some drilling to protect their respective borders. It required considerable money, however, to gain the foothold they now possess, and as an annual rental to avoid the necessity of drilling, they have paid large amounts. Before profits can be properly estimated, therefore, this must be returned. It is quite certain that out of 15-cent oil these companies do not expect to realize largely, and as to the time when an advance is to occur, no man in Ohio or elsewhere can offer a substantial opinion.

During the month of April 46 wells were completed in all the sections, 29 in Wood county, 9 at Findlay and 8 at Lima. At the end of the period 43 rigs were up and building and 28 drilling. Of these Wood county had 20 rigs and 13 drilling, Findlay 11 rigs, 5 drilling, and Lima 12 rigs and 10 drilling. Of course, some of this drilling is being done by parties who have their own private shipping facilities and market for their product. These realize 25 to 35 cents a barrel and are compelled to drill in order to obtain sufficient oil to fill their contracts. Their motion usually forces others to action, as no one permits his neighbor to punch more holes into the ground along the course of a line fence than he himself possesses, even if he has to borrow the means to that end. The operators of Wood county, however, have had the bulge, so to express it, on those of the other sections owing to the fact that their wells are much more productive. Wood county is phenomenal in its gusher returns. A well that will not exceed 100 barrels a day is not considered a fit subject for enlistment in the army of paying producers. The area of this rich deposit has been gradually extending until it has reached proportions that will require a couple of years' time to properly drill. It now covers three and a half miles in width from east to west, and seven and a half in length from south to north, with the top or northern extremity as yet to be defined. There are some indications, however, of an approaching end, which are seen in the position of the Trenton rock, from which all the oil is obtained. Whenever this is discovered in the incline or dip there is danger ahead. But as there are numerous variations in its surface, even in the most prolific portions, the tests at the north are not yet sufficient to thoroughly demonstrate the idea.

The question of the illuminating qualities of the product is still a matter of serious discussion. It is certainly true that a species capable of shedding light can be and is manufactured from it, but in the crude state it is an inferior article, possessing characteristics that will forever debar it from successful competition with any other species produced on this or any other continent. The tar product is very large and the illuminating very small. As an article of fuel, however, it is destined to drive coal out of every manufacturing center within a radius of 300 miles of the seat of production, at a cost at the wells of 30 cents a barrel. It is only a question of time, however, until Ohio producers will witness improvement in the value of their product, but so long as they maintain a yield in excess of the demand, forcing an enormous outlay on the part of the pipe line to store it, they cannot expect improvement. There are now 180 tanks full of the stuff in that region, all of the capacity of 35,000 barrels, and scores more are to be erected. The foolishness, therefore, of bringing the oil to the surface under such conditions must be apparent to every one. The oil is intrinsically worth much more than it is now produced for, but when more is tendered the purchaser than he can possibly take at even the 15 cent figure it would be suicidal to offer more.

Going For the Gas Trust.

The Central Committee of the Allegheny City Gas Consumers' Association are out with an address in which they ask for funds that they may be able to go into a court of equity against all the gas companies doing business in the city. The address goes on to say:

This committee has carefully considered the questions involved, namely: The experimental nature of the fuel; the prospect of its giving out; the cost of the gas plants, etc., and still adheres to the opinion that the present rates are entirely too high. We do not believe that this fuel is likely to give out; on the contrary new fields are being developed, and gas in superabundance is found all around us. Nature has and is producing it, and it should not be used by any corporation as a means of piling up colossal fortunes at the expense of the people.

Charters have been given by the people to these corporations, not as a means of oppression, but as a means of placing this fuel at the doors of the people for their use; and if unconscionable rates are demanded for such use, our courts of equity are open to prevent and correct the same.

Nor can any language of these charters shield the managements in demanding extortionate rates, for city councils cannot bind the people and force them to submit to oppressive powers of corporations. No language of a gas charter can make it legal to demand any but a reasonable rate for the use of the gas, and courts will require the companiesto furnish it to all who want it at such reasonable rates. The cost of coal, as compared with the prevailing price of gas, is no criterion for estimating what is fair to the consumer. A reasonable profit to the companies is the only legal criterion, whether this be the full cost of coal or a half of it. The companies' agents seem to think that the people should be content if the gas they use does not cost over 50 per cent. more than coal. That is, all the advantage in the use of natural gas should go to the companies, regardless of all sense of right.

The committee believes that this beneficent fuel was created as much for the benefit of the people as for the benefit of the carriers of it. All the people should have the benefit of it and in no case should it be so high as to be beyond the reach of the humblest citizen.

There is danger that this will be so if measures are not taken to prevent it. The corporations now declare that if some of their old customers do quit using it, the increased rates will more than compensate them. And they threaten to go higher, thus going beyond the reach of still another class.

The Standard in Europe.

A New York dispatch says: The Anglo-American Oil company has lately been incorporated in London with the following Board of Directors: J. D. Archbold, George F. Gregory, W. H. Tilford, H. H. Rogers, J. H. Bliss and W. H. Libby. These gentlemen are all connected with the Standard Trust, and the English concern is merely an off-shoot, but a very important, of the Standard itself. The trust has rarely, if ever, interfered with the export trade to the extent of entering into competition in the foreign markets; it has sold its oil to the exporter, and the latter has in time distributed it through the usual trade channels.

Through this new company the Standard will be enabled to do away with the exporter and middlemen and to directly reach the jobber and the consumer. The profit on a cargo of petroleum at present prices, freight rates, etc., will not exceed nine per cer cent. This profit, however, is subject to a division among at least three different middlemen, and the gain to each individual is very little. The Standard can now add this nine per cent. to its ordinary profit from refining. They simply kill the present exporting trade and materially injure such independent refiners as they have not already absorbed.

Sufficient for the Day.

Now that a pipe line is to be laid from the Lima, Ohio, oil field to Chicago, the people of that oleaginous district are dreaming dreams and seeing visions. Already they prophesy the advancing greatness of their own field and the consequent decline of the Pennsylvania oil industry. They even go so far as to suggest a big advance in the price of Lima oil and a marked decline in the price of the Pennsylvania product. While it is perfectly natural for people, and especially Ohio people, to think well of their own products and decry those of other localities, the Ohio men should not count too many chickens before they are incubated. So far Lima oil has proven to be good for fual only. To be available for fuel it must be very cheap. Whenever it advances to the price which

Pennsylvania oil now commands other fuels become cheaper and it loses its market. Until Lima oil can be refined as an illuminating oil equal to the Pennsylvania product it is folly to talk of its being in any sense a competitor with the latter. The Lima oil men have abundant cause for thankfulness that the new pipe line will make a market for their product at a very moderate price.—*Philadelphia Times.*

Inter-State Commerce Amendment.

George Rice, the sturdy foe of the Standard Oil company and its railroad allies, thinks that the inter-State Commerce law should have these two amendments: That the fines provided by the act should apply to the shipper as well as the carrier, and that these fines should go to the informer instead of the government. The last would be certainly an incentive to have the law enforced. The first would equalize the punishment. There is justice in having the shipper, who is chiefly benefitted by receiving rebates, share the penalties with the railroad that grants the rebates. Just at present the Pennsylvania railroad is paying out thousands of dollars for having largely contributed to the millions of the Standard Oil company. Would it be anything more than fair if the Standard Oil company should bear part of this expense?—*Pittsburg Commercial Gazette.*

THE EXECUTIVE COMMITTEE

SHOW THE COST OF PRODUCING OIL IN THE BRADFORD FIELD.

THE following communication is the second circular issued by the Executive Committee of the P. P. A. since the beginning of the shut-in movement:

OFFICE OF THE
EXECUTIVE COMMITTEE.
BRADFORD, Pa., May 8, 1888.

To the Members of the P. P. A.:

GENTLEMEN: Two months ago we sent you a circular letter congratulating you upon the continued success of our united efforts to reduce the stocks of oil above ground. Recent events have seemed to conspire to test to the uutmost the stability of our membership, yet in no place have they faltered, and to-day we stand stronger than ever before. It is with unusual pride and satisfaction that we make note of these facts. In our last letter we reviewed the general statistical situation, and set forth the claim that "we should obtain $1.50 per barrel for our product to make our business one of reasonable profit." Those who seek by drilling wells or speculative manipulation to continue this period of depression in prices until our property is drained and our wells are but junk, endeavor to discredit the above assertion. Therefore we deem it our duty to state facts which any producer or speculator can readily examine and know the truth whereof we assert.

Table No. 1 shows the cost of producing oil in the white sand fields for the years 1883 to 1887 inclusive to be about $1.29¾ per barrel.

To become more fully informed as to the results heretofore obtained by drilling for oil in the prolific white sand fields of the past, and the prices necessarily obtainable to continue the business, we recall statistically the former most important and productive periods in the industry.

The operations from 1870 to 1874 (date of discovery of the Bradford field) inclusive, resulted in the completion of 7,020 wells and a total production of 38,078,000 barrels, a yearly average of 7,615,600 barrels, and an average of 5,424 barrels from each well drilled, or a gross income of $16,556.76 from each well.

The average price of oil for the above five years was $3.05¼ per barrel.

It will be seen that the result in oil obtained then was about the same as now, the average output between the two periods being then 5,424 barrels per well, and now 5,554 barrels per well.

During the following three years, viz., 1875-6-7 (being also the first three years of Bradford's developments) there were completed in the white sand fields 8,066 wells, an average of 2,689 wells per year, resulting in an average yearly production of 9,616,047 barrels. The price obtained was $2.06⅝.

Thus it will be seen that during eight years experience in white sand fields with an average price of $2.68 per barrel as an inducement, the drilling of over 15,000 wells resulted in an average production of about eight and one-quarter millions per year, considerably less than one-third of our present requirements.

There were 2,191 less wells in these fields drilled in 1878 than in 1877 by reason of the fact that during 1878 the price of oil only averaged $1.50 per barrel for the first five months and was much less for the balance of the year. This practically suspended drilling.

What stronger corroborative evidence is needed to prove that oil cannot even now be produced at an average price less than shown to be the cost in the table No. 1, notwithstanding the fact that we can drill cheaper than in the former period.

During the years 1875 to 1885 the Bradford and Allegany fields produced 138,869,000 barrels of oil at a reasonable profit.

The average price for the above eleven years was $1.23¼ per barrel.

It is unnecessary to comment here upon the productiveness of these fields, and the later effect that the stocks, accumulated in them, had on the market.

During the past thirteen years they have produced enough oil to supply, at rate of the present demand, the trade for nearly six years (5 8-10 years); and the white sand fields have produced a supply equivalent to nearly four years.

While it is true that considerable money was made in these dark sand fields during earlier periods and higher prices, they are now rapidly being exhaused, and losing money on present prices, by reason of the shrinkage of valuation caused by draining them of their oil.

Much of the former profits have been spent in seeking to be lucky owners of large wells in the deceptive white sand fields.

To call to mind how necessary it is to avoid the wasting of the little oil left in these dark sand fields we give you table No. 2, showing the cost of production in them for the year 1887, allowing for shrinkage in valuation, to be $1.11 7-10.

The consumption for 1887 was about 27,451,000 barrels.

The white sand productions for the past five years has been 46,945,000 barrels (an average of 9,389,000 barrels per year) or a supply equivalent to 1 7-10 years consumption on above basis.

The total production of Bradford and Allegany fields this year will be equivalent of, not to exceed, three months consumption.

It will be seen that even should we have prices which would warrant our producing as much oil as ever was produced in the white sands in any one year, yet we would be drawing on our stocks over 600,000 barrels per month on an average for the first year, and more thereafter as Bradford should further decline.

In the summer of 1881 our stocks were the same as now.

That year we produced 28,886,000 barrels of oil, and the consumption was about 19,865,000.

The average price of certificates for 1881 was over 19 cents higher than for 1887 notwithstanding a reduction of 6,150,394 barrels in the stocks during the latter year.

Our production is 40 per cent. less than the average daily consumption.

As nearly 60 per cent. of this product is exported, the sale of crude oil at present prices is but robbing this country of its material wealth to furnish the world an illuminant at a great sacrifice to ourselves as producers.

The history of the past seems to have been forgotten—except so much of it as refers to stocks accumulated in Bradford at a time when our consumption was very much lighter than now.

We stated on the 19th of November last, and on March 6th, that the cost of producing oil from the fields of our present supply was not less than $1.17¾ per barrel, exclusive of the cost of the land and leases drilled. We have given much thought to the subject of cost of leases, and below give the result. Your own knowledge and experience will enable you to judge as to our conservatism.

TABLE NO. 1.

COST OF PRODUCING OIL IN ALL WHITE SAND FIELDS FOR THE YEARS 1883 TO 1887 INCLUSIVE.

The principal drilling during these years was done in the Cherry Grove, Cooper, Kane, Balltown, Wardwell, Thorn Creek, Tarkill, Cogley, Red Valley, Washington, Shanopin and Pontius fields.

Number of wells drilled.....	8452	
Number of above productive.	6888	
Number of above dry.....	1564	
Cost of drilling and completing and putting to pumping 6888 producing wells, including bonus paid for leases upon which to drill, viz. *$5300.00 each.....		$36,506,400
Cost of drilling 1564 dry holes, including estimate cost of bonuses and refusals for leases, less value of machinery, etc., moved away at *$3200.00 each.....		5,004,800
Total production during that period was 46,945,000 barrels. The expense of pumping and producing this oil after the wells were completed, including torpedoing, etc., at 30 cents per barrel was.....		14,083,500
Six per cent interest on money invested.....		3,120,000
Total outlay during period.....		58,714,700
The above operations increased the production of these fields on basis of the output for Oct. 1887, 12,000 bbls. daily, valued at $450.00 per bbl. and to be deducted from cost.....		5,400,000
Total oil produced during this period.....	46,945,000 bbls	
Less ⅛ royalty to land owner.....	5,868,125 bbls	
Net to producer.....	41,076,875 bbls	
Costing.....		53,314,700
An average cost of $1.29¾ per bbl.		

*By reason of the large amount of money expended for leases for miles around every development, it is difficult to estimate the average sum for land expenditure chargeable to each well. Our figures, we believe, are considerably less than actual cost. More than ⅜ of

the new production of the past five years has come from Washington county and Thorn Creek, and in these fields, taken together, the cost of wells alone average more than the $5,300 named; but we think it prudent to be conservative in our figures.

TABLE NO. 2.

COST OF PRODUCING OIL FROM THE BRADFORD AND ALLEGANY FIELDS FOR THE YEAR 1887.

Cost of drilling and completing 190 wells, including bonus paid for leases, at $3,350 each		$674,500
Cost of pumping and keeping wells in order, torpedoing, etc., at 30 cents per bbl		2,690,400
Interest at 6 per cent, on investment		883,800
The net expenditure during the year in producing 8,968,000 bbls. of oil, and drilling wells to assist in sustaining production		4,248,700
Add to this the shrinkage in valuation in above fields by reason of drainage of territory and decline in production (we base the shrinkage from the average of October, 1886, to the average of October, 1887, the last month previous to the shut-in movement, viz.:		
Daily production for October, 1886 (bbls)	31,471	
Daily production for October, 1887 (bbls)	22,428	
Shrinkage in production	9,043	
At $500 per bbl		4,521,500
The shrinkage in valuation added to the net outlay makes the net cost of production		8,770,200
Amount of oil produced was (bbls)	8,968,000	
Less ⅛ royalty to landowner.	1,121,000	
Net to producer	7,847,000	
The income from which, at 66 cents, the average price for the year, was.		5,179,020
Net loss to producer		$3,591,180
Average cost per barrel to producer, $1.11 7-10.		

Further comments on the above tables are entirely unnecessary.

We should use our united influence to better the condition of the business in and out of the field. In this way we will have confidence ourselves, and secure the confidence of others.

THE EXECUTIVE COMMITTEE.

P. S.—The Fergus farm wells and others on the adjoining leases are now being used as a scarecrow. It may be well here to refresh our memories by giving the result of wells completed last year on the adjoining (McKeown's Martin) farm, viz:

		Barrels.
The daily average for July last of the five Martin farm wells was.		3,082
Aug. 19th these wells gauged	2,224	
And two new wells in sand gauged.	1,097	3,321
Sept, 9th the above 7 wells and one new one gauged only		1,257
Last week the production of these 8 wells and 3 others finished since on the same farm was daily but		388

Nothwstanding this production, a few weeks since the floor trade was thrown into a state of fear and excitement upon the report of "a large increase" of production resulting from a torpedo being used in the Martin (McKeown) No. 5.

The Fergus well is not nearly as good a producer as Martin 5 was and the result on her, of the incoming of other wells, but foreshadows the future of this present annex to the pool. It is entirely unworthy of the attention it is receiving.

THE EX. COM.

No More, Thank You.

Correcting a "statement that the fine imposed on the Messrs. Everest, of Rochester, by Judge Haight was paid," the *Commercial* says the mistake "was made on the strength of a remark by District-Attorney Quinby to the reporter," adding: "Mr. Quinby explains that Mr. Bacon, counsel for the Everests, became personally responsible for the amount of the fine, pending consideration of whether the case should be appealed." And the *Commercial* caps this item with the line, "Will Probably be Appealed."

Not much! There is no such probability. The convicted conspirators are not such fools as not to know when they are well out of a bad scrape. If they don't their sharp attorneys certainly do, and if there is to be any appeal there will have to be some more lawyers in the case.

If the joint fine had been five or even fifty thousand dollars, instead of a paltry five hundred, the Standard Oil company would pay the money rather than allow the two Everests to be tried again. One such series of revelations is a dose strong enough to make even the Octopus sick.

The *Commercial* need not expect to have the opportunity of misreporting another trial of this celebrated case, with the interested view of prejudicing the people's side of it, as before. Burnt children dread the fire.—*Buffalo Express.*

OPERATIONS IN APRIL.

Wells Completed, Wells Drilling and Rigs Up and Building in the Entire Region.

THOUGH the balmy days of spring make the incorrigible operator's fancy lightly turn for fresh worlds to conqueror he is apt in the end to follow great Alexander's example and weep because there is a corner on worlds. He who has prodded the bosom of Mother Earth outside the well defined boundaries did not achieve a remarkable showing during the month of sunshine and showers. One-third of all the wells drilled in Pennsylvania were dusters and the aggregate of new production is far less than that brought to the surface in March. The spirit of the shut-down has been rudely buffeted by an unforseen tumble of values, unexpected developments in doubtful districts and mendacious reports as to its stability, but it has risen like a duck after each opposing wave has passed, shaken its feathors and swum right ahead on the crest of public opinion.

The open weather has stimulated new operations somewhat, chiefly in the fascinating pools of Butler and Washington but the leaven of restriction is already beginning to work in these places and at Saxonburg in particular, has had a marked effect. That other operators may be induced to take a business-like view of the situation and aid in giving the drill a rest where it is most needed is quite within the bounds of possibility. Considering the favorable weather and the strong attraction the gusher pools hold forth the result of the fieldman's efforts cannot be regarded as discouraging. Cupidity is often heedless to the appeals of common sense and self-protection is to be credited with some of the work that is revealed in the busiest sections. There are instances where in spite of neighborly greed operators have heroically abstained from adding to the new work by protecting their lines and their conduct is in striking contrast to those who, deaf to every appeal of business or the common weal, continue to ply the drill with feverish force. The force of habit still remains and a gusher maintains some of its terrors in the face of a general situation inflexibly pointing to higher prices. It is too much to hope that stampedes on decisive news from the front will soon become a thing of the past. With the exception of one or two spurts of industry the scouts, who have become an unknown quantity in the oil country, have had little to do and the mysteries that flashed upon the trade like rockets fell out of sight as quietly as rocket sticks.

The following tables show the completed work of April and March side by side:

WELLS COMPLETED.

	April.			March.		
	Wells.	*Prod.*	*Dry.*	*Wells.*	*Prod.*	*Dry.*
Allegany	..	..	..	1	..	1
Bradford	1	6	..	3	11	1
Middle Field	6	20	3	4	12	3
Venango	6	32	2	20	93	5
Clarion	10	27	7	4	43	2
Butler and Armstrong	13	234	5	26	1247	8
Washington	10	328	3	7	1566	2
Greene Co., etc.	..	..	..	1	40	..
Beaver Co.	3	0	3	..	..	.
Total	49	647	23	66	2059	22
Total March	66	2059	22			
Difference	17	1412	1			

The new work under way at the close of April and March is compared in the following table:

RIGS AND WELLS DRILLING.

	Apr. 30, 1888.			Mar. 31, 1888.		
	New Rigs.	*Wells Dr'g.*	*Total.*	*New Rigs.*	*Wells Dr'g.*	*Total.*
Allegany	..	..	..	1	..	1
Bradford	1	0	1	1	..	1
Middle Field	1	3	4	2	7	9
Venango	5	11	16	6	8	14
Clarion	0	3	3	3	8	11
Butler & Arm.	13	27	40	6	20	26
Washington	14	35	49	16	25	41
Greene Co., etc.	3	3	6	..	2	2
Total	37	82	119	25	70	105
Total Mar. 31.	35	70	105			
Difference	2	12	14			

There is shown a decrease in the number of wells finished in April over March of 17, while the two more rigs built during the month fail to make good the deficiency. Neither does the total increase in new work equal the falling off in completed wells. The most striking feature is the decrease in new production from the March figures, which is 1,400 barrels. As a whole the operator's reward in April was much less than that in March. He sank 72 holes good, dry and indifferent with an average reward of 9 barrels to a hole, while the average in March was 22½ and the producer received a far better price for his oil. Nature which has aided the shut-in by shrinkage so that many members of the P. P. A. by due diligence in pumping are only enabled to get out half their yield of last summer, has correspondingly failed to reward those who persist in bouncing the drill in the face of popular opinion and oft times in defiance of their neighbors' expostulations.

WELLS COMPLETED IN APRIL.

Bradford Field.

Location.	*Owner.*	*Production.*
Summit,	W B Hockenberry	6

Wells completed	1
Production	6
Dry	0

Middle Field.

CHERRY GROVE.

Lot 661, Carroll & Co.	dry

TIONA.

Lot 109, J W Sherman	5

GRAND VALLEY.

Grove, Grove & Son	5

FOREST COUNTY.

——, Hagin.....dry

KINZUA.

Lot 122, Hamilton township, Van Scoy..... 10
Whitcomb, Frederick & Co.....dry

Wells completed..... 6
Production..... 20
Dry..... 3

Venango.

Hamilton Run, McComb Bros.....dry

RED VALLEY.

Black heirs, A P Dale..... 10

VICINITY PLEASANTVILLE.

Blank, Black Bros No 3..... 10
" No 4..... 10
Pleasantville Boro, A W Brown..... 2
" Corwin & Walters.....dry

Wells completed..... 6
Production..... 32
Dry..... 2

Clarion.

Fillman, J R Fillman.....dry
Snyder, Salem Gas Co..... 2

CLARION BOROUGH.

Garvin, Cadwallader.....dry
Maffett, Rider & Aiken.....dry
Strickler, S Andrews & Co.....dry
D B Curll, Jacob Hahn.....dry
Sloan, Piper & Brown..... 5
Arnold, Cadwallader & Co No 4..... 20
P & W R R, Semple & Co.....dry
Arnold, C A Leeper & Co.....dry

Wells completed..... 10
Production..... 27
Dry..... 7

Butler and Armstrong.

Robinson (Allegheny twp), E Robinson..... 15
W Ellison (Boydstown), McClung & Golden.dry
Logan, J J Leidecker.....dry
Freedly, Westinghouse & Co.....dry
Whitmire, Brown & Co..... 12

REIBOLD.

Snow, Gantz & Co No 3.....dry
Goehring, Guckert, White & Co No 1..... 60
" " No 2..... 40
Galebaugh, Connors, Fishel & Bredin..... 2
" Leidecker Bros.....dry

BRUSH CREEK.

Ulrich, Munhall & Co..... 70
Duthil, Chambers Oil Co No 2..... 35

Wells completed..... 12
Production..... 234
Dry..... 5

Washington.

Davis, Davis Bros No 1..... 7
Gordon, People's H & L Co No 8.....dry
Munce, I Willetts No 30..... 25

CANONSBURG.

Giffin, J McKeown No 2..... 20
" " No 3.....dry
Black, Hoag & Co.....dry
McLaughlin, Canonsburg Gas Co..... 38
Morganza, Flinn & Booth No 2..... 75
" " " No 3..... 10

TAYLORSTOWN.

Martin, Kuntz & Co No 1..... 153

Wells completed..... 10
Production..... 328
Dry..... 3

Beaver County.

Collins, A F A Brown & Co.....dry
Robb (Oakdale) A F A Brown & Co.....dry
Murdockville (Rochester) A F A Brown & Co.....dry

Wells completed..... 3
Production..... 0
Dry..... 3

WELLS DRILLING, RIGS UP AND BUILDING MAY 1, 1888.

Bradford Field.

Farm. Owner. Condition.
Schoonover (Sawyer), Kelly Bros..... rig
Lot 122, Armstrong & Co (old rig)..... .

Rigs up and building..... 1
Wells drilling..... 0

Total..... 1

Middle Field.

CLARENDON.

Lot 532, C A & D Cornen No 5 (shut down). 900
562, Goal Bros (old rig).....

HICKORY TWP, FOREST COUNTY.

Brown, Gorman & Wagner..... rig

HARMONY TOWNSHIP, FOREST COUNTY.

Shriver, Shriver & Co.....drilling

MISCELLANEOUS, ELK COUNTY, ETC.

2032, Boggs, Rosenberg & Co.....drilling

KINZUA.

Richardson, Hubbard & Co.....drilling

Rig up and building..... 1
Wells drilling..... 3

Total..... 4

Venango.

Miles, Buxton & Co.....drilling
Hoffman (Clintonville) Taylor, Hoffman & Co..... 500
Hilliard (Clintonville) Hilliard & McKee.. rig
Bumstead (Oil Creek), J S Bumstead..... rig
McMulleu (Raymilton), Crispen & Holt.....drilling
Mason, (Cherrytree) Goldstein, Hasson & Lentz.....drilling
Chandler (Oil Creek), J Y Siggins..... rig

SLAB FURNACE, HALL'S RUN, ETC.

Black heirs, A P Dale.....drilling
McCalmont, Koch Bros.....drilling
Grant, Kelley & Smullin.....drilling
Zeigler, Wolf & Shafer.....drilling

VICINITY EMLENTON.

Fox, Fox & Morgan (2 old rigs).....
Crawford, F W Crawford (old rig).....

VICINITY PLEASANTVILLE.

Pithole, Davis & Lee..... drilling
Blank, Black Bros No 5.....drilling
" No 6..... rig bldg
Pleasantville Boro, Alex Brown.....drilling
Noyes, H H Noyes.....rig bldg
Field, Cornin, Walters & Benedict (old rig)
Lyle, Alex Lowry (old rig).....

Rigs up and building..... 5
Wells drilling..... 11

Total..... 16

Clarion.

CLARION BOROUGH.

Sloan, Piper & Brown No 2..... drilling
Agey, Jordan & Co No 1.....drilling
Sloan heirs, —— No 1.....drilling

Rigs up and building..... 0
Wells drilling..... 3

Total..... 3

Butler and Armstrong.

Mahon & Co, Hart & Co.....sand
Wilson, (Evans City) Frederick & Co.....1300
Montgomery, (Bakerstown) Calhoun & Co. 750
Breckel, " Butcher & Co.. 800
Gold, " Hummel & Co..200
Douthett, (Marston) Miller & Pusey..... 500
Hosex, McClurg & Co..... 600

REIBOLD.

Schilling, Grimes & Co..... rig
Galebaugh, Guckert & No 3..... rig
Behm, Golden & Co.....rig bldg
Ramsey, Lapp & Co.....rig bldg
Ash, Guckert & Co..... 100
Goehring, Guckert & Co No 3..... rig
Miller, Schlegel & Lentz No 3.....1450
" " " No 4.....1500
" " " No 5..... 300
" " " No 6..... 200
Snow, Gantz & Co No 2.....1600
Schilling, " .....rig bldg
Schilling, Guckert & Co.....rig bldg
Galebaugh, " No 2..... 800
Blakeley, Coast & Co No 5..... 200

BRUSH CREEK.

Swindeman, J A Snee & Co..... 600

DEER TOWNSHIP, ALLEGHENY COUNTY.

Canahan farm, Freid & Co.....drilling

THORN CREEK AND VICINITY.

Lavey, B Lavey.....drilling
Bulford, A J Haltry.....rig bldg
Patterson, E. N. Patterson.....rig bldg

SAXONBURG.

Foercht, Lavens, Urquhart & Co No 4..... rig
Upper Crawford, Haymaker & Co No 2.....1650
" " " No 3..... 800
Lower Crawford, Haymaker & Co.....drilling
Lonitz, Bolard & Greenlee No 1 (shut down)
" " No 2 (shut down)
" " No 3 (stopped)... rig
Muder, Thyng & Co (shut down).....
Foercht, Lavens, Christie & Co (shut down)
12-Acre lease, Bolard, Greenlee & Co (shut down).....
Muder, Baker & Co..... 800
Seibert, Baker & Co.....1200
Smalley, Root Bros.....1800
Adderhold, McBride & Golden.....1500
Lonitz, Bolard & Greenlee No 3.....1500
Pfabe heirs, Reiber & Co No 2.....1600
Smalley, Iman & Co.....1500
Helmbold, B B Campbell No 1..... rig
Cochran, Calhoun & Co..... rig
Seibert, Snee & Co No 6..... rig

Rigs up and building..... 13
Wells drilling..... 27

Total..... 40

Washington.

Cameron, Chartiers Oil Co No 12.....2300
" " No 13.....2275
Fergus, " No 8.....2100
" " No 9.....2000
" " No 10.....2000
Plymire, " No 1..... 700
Fergus, S Fergus No 2.....1650
" " No 3.....1550
" " No 4..... 600
Fergus, Sr, S Fergus No 1..... 600
Peese, " No 1..... 70
Davis, Davis Bros No 3..... 500
McBurney, Wheeling Oil Co No 2.....2000
" " " No 3 (fishing).1680
Martin, Central Oil Co No 5..... 250
Cameron, Young & Willets No 1.....2000
" " " No. 2..... 800
Munce, I. Willets No 31.....1800
Vance, McKenua Oil Co No 1.....250
Andrews, Andrews Bros.....1100
Shirls, Shirls No 4.....sand
Fergus, Chartiers Oil Co No 7..... rig
" S Fergus No 5..... rig
Davis, Davis Bros No 2..... rig
McBurney, Wheeling Oil Co No 4..... rig
" " " No 5..... rig
Martin, Central Oil Co No 6..... rig
Munce, I Willetts No 32..... rig
Quail, J McKeown No 5..... rig

CANNONSBURG.

Gladden, Cannonsburg Oil Co.....2025
McKeown, Manufacturers' Natural Gas Co No 2.....2420
Townsend, Greenlee & Co..... 200
Morganza, Flinn & Booth No 4..... rig
Mack, Fisher & Guffey No 1..... rig
Douglass, Manufacturers' Natural Gas Co No 1..... rig

TAYLORSTOWN.

Grimes, Marshall Oil Co No 1.....2500
Hilton, Jo Jo Oil Co No 3.....1300
" " " No 4..... 600
Blaney, Dovan & Miller..... 350
Crawford, Reighard & Co.....1100
McCabe, R H Thayer.....1200
Kennedy, Mack & Craft..... 450
Ahbruch, Couter & Hopt..... 500
Crothers, Caldwell & Co No 3.....1390
" " No 4..... 600
S H Weirich, Reed & Co.....1500
Hilton, Jo Jo Oil Co No 5.....rig bldg
Martin, Kuntz & Co No 2..... rig
Thompson, Aiken & Co..... rig

Rigs up and building..... 14
Wells drilling..... 35

Total..... 49

Greene County.

Donley, Mt Morris, E M Hukill No 1.....1800
Jones, " Ohlson & Co (fishing)...1740
Donley, " Alexander & Co No 2... 250
Evans, " E M Hukill No 1..... rig
Moore, " Fall & Co No 1.....rig bldg
" " McCool & Co.....rig bldg

Rigs up and building..... 3
Wells drilling..... 3

Total..... 6

BRADFORD AND ALLEGANY,

It is scarcely a decade ago when the Bradford and Allegany fields seemed flowing with oil. Then the producer built his rig, drilled the hole and a bountiful supply of crude petroleum was obtained. The report of the operations for a single month made a total that almost seemed incredible. The present year shows plainly that the drill has ceased and that the immense subterranean resevoirs are becoming exhausted. During the month of March only four wells were

completed in the two fields, while April, which is just passed, can only show the completion of one well whose rig had been standing ready for drilling for the past four years. The well, which is owned by C. B. Hockenberry, of Summit City, began with a production of six barrels a day. Kelly Bros. have the only new rig in the entire fields.

THE MIDDLE FIELD.

In the middle field three producing wells have been found. One of them is located at Tiona, another at Grand Valley an the third is the one that during the past month was played as a mystery. It is situated on lot 122, Hamilton township, McKean county, and is owned by Dr. Van Scoy of Bradford. The entire new production of this field does not amount to more than 20 barrels a day with average of about 5 barrels to each new producer. On account of the exact truth in regard to the Van Scoy well being unknown that well is placed at 10 barrels per day, which according to the reports of well-informed scouts, is a little in excess of what it is doing. Carroll & Co., who have been pounding the drill at the rate of 900 feet a month, found at last that their venture at Cherry Grove was dry, Rosenberg & Co., on lot 2,032 Elk county, because of unseen misfortunes are still drilling their well which should have been finished early in the month. The Wilcox Oil company were successful in finding gas at their wells on lot 2260 in the same county. The Clarion river mystery of Jim Welsh is still unsolved both by the general public and James himself.

VENANGO.

In spite of the small returns that a seeker after crude petroleum gets in Venango county the drill is not altogether silent. At Emlenton no work is being done, nor has any one attempted to do any for a long time. In the vicinity of Pleasantville the Black Bros. seemed to be the most persistent of them all. They continue to erect derricks and quite frequently get small producers of the regulation capacity. In the town the work has not been so successful, a dry hole and two-barrel well were all that April could bring out. Near Red Valley A. P. Dale, on the farm leased of the Black heirs, obtained oil in small quantities at the well drilled there. Throughout the county there are several wells that are down quite a distance, and in a short time the owners will ascertain whether there will be sufficient oil in their wells to keep their tools from getting too warm.

CLARION.

Clarion, which for the past two months has been very active, has at last reached that period when work must cease. All available territory within the boundaries of the county and the borough of Clarion itself have been taken up and a greater portion of it has been thoroughly peppered. The Producers' Protective association at present controls nearly all that remains, and when rigs appear on these leases the shut-down and shut-in movement will have ended. Another great check to all future drilling is the almost unbroken line of dry holes that have rewarded those who have drilled during the month of April. The six dusters in the borough will aid the city authorities in preventing future work within its limits. Piper & Brown found a 5-barrel-a-day well and Cadwallader & Co. claim a 20 barrel well. Outside of the borough the Salem Gas Co., on the Snyder farm, secured a 2 barrel prize package.

BUTLER AND ARMSTRONG.

In the fore part of last month the mediations of the P. P. A. were so far successful that Haymayker & Co.'s well on the Crawford was shut in for the balance of the shut-down year and work was stopped on ten wells and rigs in the immediate vicinity, leaving twelve drilling wells and rigs at the close of the month. The number of producing wells has been reduced to 51. Fishing jobs and salt water have aggravated operators in this section, which has no longer such a heavy claim on public attention. The daily production has fallen off 600 barrels from the first of last month. The well on the Whitmore, two miles south of Greece City, near Boydstown, made some talk during the month just ended. The record of wells in that vicinity is that they start in strong and blow out quickly. At Reibold Schlegel & Lentz are following up their hand with a number of imitators. Brush Creek is quiet.

WASHINGTON.

Canonsburg is running "emptin's" and its history promises soon to be only of interest to those who ponder over the has been. At Washington the limit of the Fergus pool will be pretty effectually tested by ventures due this week. Barring drainage some fair wells may be expected. Rigs up indicate a determination to follow up whatever is gained by the ventures now seeking the sand. In spite of glycerine having been used in the field a decline of about 700 barrels in production from March 31 is shown.

GREENE COUNTY.

At Mount Morris three wells are starting and others are contemplated. The Hukill well on the Donley farm has been mystified during the month. Prospective operators are waiting to see what they shall see.

Beaver county limps forth with three dry holes, drilled on as many farms by A. F. A. Brown & Co.

Oil Fuel for Engines.

William Smith, of Pittsburg, has invented a device for burning petroleum gas in locomotives which is described as follows: In the space in the tender usually occupied by the coal is a sheet iron retort, rectangular in form, with a curved top, a fire box being underneath. At the end of the fire box and connected with the flue from it, is a small upright boiler with 13 flues in it, capable of sustaining about 120 pounds pressure, although only 60 pounds are carried. The stack from the boiler and retort rises about as high as the stack of the locomotive. At the rear of the tank, and high enough to allow gravitation of fluid into the retort, is a sheet iron oil tank, with a capacity of 4½ barrels. From the tank of oil a pipe leads to the retort, in which there are six orifices for the oil to enter, the quantity being regulated by a needle valve. From the retort a four-inch pipe, with a suitable valve, leads to the fire box of the locomotive, a piece of stout hose being used for the connection between the tender and engine. Entering the base of the retort are two steam pipes through which jets of steam are forced to cause the gas to find its way into the fire box, which is filled with broken brick. This steam pipe is connected with the locomotive, so that steam from it can also be used.

Friday morning a *Dispatch* reporter saw the apparatus successfully tried. The fire was lit in the retort fire box, and in a short time the pressure of steam in the little boiler was sufficient to allow gas to be made. The oil was turned into the hot retort, a piece of lighted waste was thrown into the locomotive fire box, and a short puff announced that the gas was burning. A slight fault with the small injector caused trouble, but the gas was again turned on, and in a locomotive which it requires coal three hours to steam the gas did the work in one hour. When a sufficient pressure of steam had been obtained in the locomotive it was run out of the roundhouse into the yard, and made numerous trips up and down the tracks in a very easy manner, the steam pressure being very easily maintained by the gas and the now almost white hot bricks. The mechanics about the shops were much interested in the test and seemed to get rid of some doubts which they had had concerning it. One or two little details which need improving will be attended to by Mr. Smith very soon, and then more extensive trials of the apparatus will be made.

THE EVERESTS SENTENCED.

A LIGHT FINE IMPOSED. WHAT C. B. MATTHEWS HAS TO SAY.

AT Buffalo, May 8th, Hiram B. Everest and Charles M. Everest, his son of the Vacuum Oil works, of Rochester, convicted of conspiracy in trying to injure trade and commerce by blowing up the Buffalo Lubricating oil works in 1881, were fined $250 each by Judge Haight in the Supreme Court. District Attorney Quinby represented the people, and Andrew Bacon, of Rochester, the defendants.

Judge Haight in sentencing the Everests said that owing to the advanced age of Hiram B. Everest, the petitions of many prominent citizens of Rochester and Buffalo praying him only to impose the lightest fine possible, the fact that six of the jurors had made an affidavit since the trial that in their belief the Everests were not guilty of actually tempting to blow up the Buffalo works, and last because there were so many suits pending, involving some $2,000,000, that he deemed the $250 fine sufficient punishment. His sentence was prepared in writing and filed with the clerk of the court.

Lawyer Bacon appeared in person for Hiram B. Everest, as the latter was ill at his home, and paid the fine at once.

There were many interested spectators present, including C. B. Matthews, president of the Buffalo Lubricating oil works, and others.

In the course of a lengthy interview C. B. Matthews, president of the Buffalo Lubricating Oil Company, freed his mind to a Buffalo *Courier* reporter on the Rochester conspiracy case. Among other things he said: "The sentence was very light considering the crime proved in court. If any crime at all was proved it was the most atrocious crime that was ever committed in Erie county. The deliberate planning and intent was to blow up the Buffalo Lubricating oil works at a time and in a manner that was almost sure to cause considerable loss of life, together with the complete destruction of the property. The fortunate series of

circumstances to a large extent averted the disaster, although one of the stills was severely injured and a large amount of oil was burned up.

"It was clearly proved by evidence, undenied and undeniable, that the convicted parties planned this monstrous crime with great deliberation, and even went so far as to take counsel of an attorney as to what extent they could go in this nefarious scheme and escape punishment. The animus of this great crime, however, lay back of the Everests and in the plans and purposes of the great Standard oil trust, in whose hands the Rochester convicts were tools. The Standard Oil Company itself in its beginning was merely an organized appetite for money; it has become an organized conspiracy against the rights of mankind. At the time that the Standard oil magnates were indicted for conspiracy I had supposed that the indictment of these men with such ample proof of their guilt would deter them from further overt acts in their conspiracy to destroy my company, its property and its business; but I find that railroads, acting under contracts dictated in the interest of the Standard monopoly, have refused to ship us crude oil as common carriers, practically admitting that they were required by the Standard to starve out refineries not operated by the great monopoly.

"It was proved in this trial, also, that during the pendency of these indictments the Standard corrupted men in our employ, paying them higher wages for spying and sneaking about our works than we were paying the same men for regular work in our refinery. It was proved on the trial that these spies in their employ made reports of the operations at our refinery to S. C. T. Dodd, the great Standard attorney, who has recently published a standard work on combinations, which work is considered by many a standard whitewash. The work, however, does not mention the number of private detectives, spies and sneaks throughout the country that have made or are making reports to Mr. Dodd, that the Standard company may be enabled to complete the destruction of rival companies and destroy individual enterprise and commercial liberty among the people throughout our land. The Rev. Dr. Anderson, of Rochester University, speaking in the columns of the *Baptist Examiner and Chronicle*, has highly recommended Dodd's great work on the Standard Oil company. Dr. Anderson's sentiments regarding the Standard Oil company can be accounted for by those who are aware of the fact that some eminent Standard men have contributed $50,000 or upward to endow a branch of the institution known as Rockefeller hall. It is said that the venerable doctor is not averse to receiving still further benefactions from the same source for the needy institution, of which J. D. Rockefeller is a trustee. I think the reverend doctor was getting a little out of his province when he headed a list of Rochester gentlemen, asking of our courts a very light sentence on the conspirators actually convicted of crimes committed in Buffalo, which petition undertook to instruct the court as to the character of the evidence on which the jury found a verdict of guilty. Dr. Anderson ought to know, if he does not, that the great resources of the church, as well as its moral and religious power, always has and always will come from the common people, and although wealthy men may distribute large amounts in money or in coal, in the line of what they term charities, a much larger amount of money for moral and religious uses will come to the support of the church when the church stands firm for the commercial liberties of the people, refusing the loot pirated from the public.

"It is very encouraging to the laity of the church to see that the *National Baptist*, of Philadelphia, understands the dangerous encroachments that the Standard Oil Trust has made, within the church and state, and it will prove a bitter day for the church if they heed not the warning and regard not the counsel of this able defender of the church in its truest and brightest interests. I have recently received from an eminent divine an interesting letter from which I make this quotation: "I have no doubt that the managers are personally good men, as have been many distillers, shareholders, tyrants, etc., but the system of which the Standard is a specimen is in my opinion utterly wrong, unjust and dangerous to society. I do not what will be the outcome, but I think that unless these abuses are remedied through law, they will be reached without law. It is just these things which engender anarchy. Every minister who sees something for his church, every professor who sees something for his college or seminary, every editor who sees advertisements, every politician who sees something for his party, will follow the impulses of human nature."

"It should be borne in mind that some of the men indicted and tried in Buffalo for conspiracy had previously been indicted for the same offense in other States and are men who understand thoroughly the laws they violate. Very different is the case of the criminals known as Theiss boycotters in New York. These men were proven guilty of having distributed in the public streets of New York circulars requesting people not to buy beer manufactured by Theiss. In less than two months from the time they dropped those circulars in the streets the parties were each serving a sentence of one year's duration in Sing Sing. It was shown on the trial that these men were entirely ignorant of the fact that they were violating any of the laws of our State in the course they took in the matter. In contrast with the manner in which these poor, ignorant men were treated by the courts, it might be well to mention the fact that the Rochester conspirators have regarded our courts as mere spider-webs, with which they could toy at leasnre.

"One of the conspirators since the jury last May brought in a verdict of guilty, has been married in what may be truly termed high life. The wedding was attended by numerous magnates of the Standard Oil company and affiliated interests, and Buffalo furnished its full quota of guests, although the wedding was in New England. The presents were many and costly, and the bridegroom indulged in an extended European wedding tour, and seemed to enjoy the trip and the honeymoon as completely as if he had previously had a revelation from the court that the penalty of his crimes would be $250, probably contributed by the great Standard Trust, claiming to be worth over $150,000,000. The old gentleman was and is eating oranges under his trees on the Pacific slope, without even being vexed to make a journey east to hear his sentence."

Pipe Line Summary.

Following is a comparison of the figures of the National Transit and Tidewater pipe lines for March and April:

NATIONAL TRANSIT CO.

	Barrels.
Acceptances, etc., March 31	17,572,036.33
" " April 30	17,013,288.67
Decrease	558,747.66
Credit balances March 31	6,007,675.12
" " April 30	6,150,787.85
Increase	143,112.73
Total liabilities March 31	23,579,711.45
" " April 30	23,164,076.52
Decrease	415,634.93
Gross stocks March 31	26,860,980.31
" " April 30	26,589,689.17
Decrease	271,291.14
Sediment and surplus March 31	3,281,268.86
" " April 30	3,425,612.65
Increase	144,325.79
Receipts from all sources March	1,181,486.72
" " " April	1,212,640.74
Increase	30,804.02
Total deliveries March	1,800,284.05
" " April	1,626,653.31
Decrease	173,630.74
Runs from wells March	925,107.03
" " " April	940,647.05
Increase	15,140.02
Regular shipments March	1,847,301.07
" " April	1,626,653.31
Decrease	220,647.76

The total receipts of the Transit Company for April were made up as follows:

Runs from wells	940,647.05
Received from other lines	271,993.69
Total	1,212,640.74

The deliveries for April were made up as follows:

Regular shipments	1,590,640.89
Delivered to others lines	36,102.42
Total	1,626,653.31

TIDEWATER PIPE CO.

Acceptances, etc., March 31	549,000.00
" " April 30	540,000.00
Decrease	9,000.00
Credit balances March 31	639,179.51
" " April 30	584,879.85
Decrease	54,299.66
Total liabilities March 31	1,188,179.51
" " April 30	1,124,879.85
Decrease	53,299.66
Gross stocks March 31	1,349,096.88
" " April 30	1,296,564.77
Decrease	52,532.11
Sediment and surplus March 31	160,887.37
" " April 30	171,684.92
Increase	10,797.55
Receipts from all sources March	151,731.46
" " " April	151,509.94
Decrease	221.52
Total deliveries March	182,219.45
" " April	200,957.37
Increase	18,737.92
Runs from wells March	115,615.14
" " " April	115,497.52
Decrease	117.72

The above receipts for April were made up as follows:

Runs from wells	115,497.52
Received from other lines	36,012.42
Total	151,509.94

Every new drill that is set in motion around the Fergus wells, at Washington, only hastens the time when that field will lose the reputation that it has at present. Like the old deserted fields of former days, it is having its period of excessive operation, which will bring forth all the oil that it contains.

Stocks Abroad.

Reports of stocks in London and the seven principal Continental ports are summarized in the following statement:

Stocks Afloat and Ashore.	*April* 21, 1888. *Barrels.*	*March* 24, 1888. *Barrels.*
Seven Continental ports	489,457	558,253
London and English ports	... ..	119,573
Total stocks afloat and ashore	489,457	677,826
Decrease in stocks since March 24	188,369	

A detailed statistical table giving the stocks on hand, the stocks in vessels on the ocean, and the amount unloading from the vessels at the different ports is appended, which shows at a glance the condition of affairs abroad and the increase or decrease as compared with the corresponding period of 1887. The shipments represent the amount of oil going to the interior of Europe from the seaports:

STOCKS IN FOREIGN PORTS APRIL 28, 1888.

Ports.	*Stocks April* 21.		*Stocks afloat April* 21.		*Loading April* 21.		*Grand total stocks afloat and loading.*		*Receipts from July* 1.		*Shipments from July* 1.	
	1887	1888	1887	1888	1887	1888	1887	1888	1886	1887	1886	1887
	Barrels.	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*	*Barrels.*
Bremen	65,692	84,811	23,129	8,202	15,700	.....	104,521	93,013	585,164	745,248	730,858	810,826
Hamburg	38,739	109,588	69,865	28,876	57,400	14,500	166,004	152,964	759,618	958,802	875,744	965,287
Antwerp	22,667	74,656	57,946	18,673	26,000	8,000	106,613	101,329	706,411	770,494	844,745	799,250
Rotterdam	19,370	41,225	58,504	13,805	14,000	6,500	91,874	61,530	433,833	429,702	496,404	438,360
Amsterdam	5,263	25,795	33,946	7,153	.....	.....	39,209	32,948	200,221	225,895	262,436	231,338
Stettin	14,711	1,162	14,051	39,747	14,700	.....	43,462	40,909	305,297	268,853	306,479	304,302
Danzig	12,276	300	.....	6,464	.....	.....	12,276	6,764	54,945	42,517	71,906	68,419
Total	178,718	337,537	257,441	122,920	127,800	29,000	563,959	489,457	3,045,489	3,441,511	3,588,572	3,618,052
London	111,436	.....	19,400	.....	.....	....	130,836	.....	506,151	....	653,861	....

	1885	1886	1887	1888
Total stocks Continental ports	572,114	398,140	178,718	337,537
Total afloat " "	170,318	183,290	257,441	122,920
Total loading	163,600	170,900	127,800	29,000
Total	906,032	752,330	563,959	489,457
Afloat and loading for direct Continental ports	25,900	8,000	11,500	.....
" " " Baltic Sea, exclusive Stettin and Danzig	18,800	29,300	24,600	.....
Total Afloat and loading for Continental ports	950,732	789,630	600,059	.....
" " " " " London	132,272	118,102	130,836	.....
" " " " " English harbors, exclusive London	33,500	18,800	54,200	.....
Grand total	1,116,504	926,532	785,095	.....

OFFICIAL STATEMENT—EXPORTS OF PETROLEUM, APRIL, 1888.

BY WM. F. SWITZLER, CHIEF OF THE BUREAU OF STATISTICS, WASHINGTON, D. C., MAY 10, 1888.

Customs Districts.	*Mineral Crude.*		*Napthas.*		*Illuminating.*		*Lubricating and Paraffine Oils.*		*Residuum.*		*Total.*	
	Gallons.	*Dollars.*	*Gallons.*	*Dollars.*	*Gallons.*	*Dollars.*	*Gallons.*	*Dollars.*	*Gallons.*	*Dollars.*	*Gallons.*	*Dollars.*
Boston & Charlestown, Mass	.....	.....	.....	.....	468,288	46,607	15,175	2,463	.....	.....	483,463	49,070
New York, N. Y.	2,538,365	189,287	348,692	28,252	19,481,713	1,815,330	1,766,264	365,349	173,712	7,882	24,308,746	2,406,100
Philadelphia, Pa.	1,848,613	124,339	897,699	63,583	5,085,989	466,495	285,345	20,047	.....	.....	8,117,646	674,464
Baltimore, Md.	.....	.....	.....	.....	11,620	1,141	16,964	2,097	.....	.....	28,584	3,238
Total April, 1888	4,386,978	313,626	1,246,391	91,835	25,047,610	2,329,573	2,083,748	389,956	173,712	7,882	32,938,439	3,132,872
Total April, 1887	4,237,518	269,439	651,435	55,805	33,732,966	2,555,386	1,545,071	281,669	853,356	38,804	41,020,346	3,201,103
Total 9 months ending April 30, '88	74,141,944	5,032,768	10,721,090	871,052	364,304,708	28,616,411	19,074,470	3,244,725	1,110,228	56,352	469,352,440	37,821,308
Total 9 months ending April 30, '87	64,353,328	4,119,325	13,351,001	1,172,312	375,913,200	29,181,371	14,204,293	2,602,705	2,836,756	136,394	470,658,578	37,212,107

CRUDE QUOTATIONS FOR APRIL, 1888.

Day of Month and Week.	Bradford.				Oil City.				New York.				Pittsburg.			
	Opened	*Highest*	*Lowest*	*Closed*	*Opened*	*Highest*	*Lowest*	*Closed*	*Opened*	*Highest*	*Lowest*	*Closed*	*Opened*	*Highest*	*Lowest*	*Closed*
2—Monday	83½	83¾	78¼	81	83¼	83⅝	77½	81	83½	83⅝	78⅜	81⅛	83⅞	83⅞	77½	81
3—Tuesday	81¼	81¾	75½	79⅜	81¼	81¾	75⅜	79¼	81¼	81¾	75½	79⅜	81¼	81⅝	75⅜	79⅜
4—Wednesday	79	79⅝	76⅝	78	78¾	79½	76¼	78	79⅛	79½	76⅝	78	79	79½	76⅜	78
5—Thursday	78	78	74¼	75¾	77½	77⅝	73⅞	75⅝	77¾	78	74¼	75¾	77½	78	73¾	75⅝
6—Friday	75½	79⅜	75½	78⅜	75¾	79⅜	75¾	78¼	75½	79½	75⅜	78¼	76	79⅜	75¾	78⅜
7—Saturday	78¼	79⅝	78	79¼	78	79⅝	77⅞	79⅛	78⅜	79⅝	78	79⅛	78	79⅝	77⅞	79⅛
9—Monday	78¼	79⅝	78	79¼	79½	81	79	79	79½	81	79	79	79½	81	79	79
10—Tuesday	78⅞	78⅞	76½	77⅝	78½	78⅝	76½	77⅜	78½	78¾	76¾	77½	78½	78⅝	76½	77½
11—Wednesday	77¾	78½	76¾	77¾	77½	78⅝	76⅞	77⅝	77⅞	78¾	76¾	77¾	77½	78½	76⅞	77⅞
12—Thursday	78	79⅞	77⅝	79¼	78¼	80	77½	79⅛	77¾	79⅞	77½	79⅜	78	80	77½	79¼
13—Friday	79½	80¾	79½	80⅜	79⅞	80⅞	79½	80⅜	79⅞	80¾	79⅜	80⅜	80	80⅞	79⅜	80⅜
14—Saturday	80¾	82½	80¾	82¼	80½	82⅜	80½	82¼	80¾	82½	80⅝	82⅛	80½	82⅜	80½	82¼
16—Monday	82½	86	82½	85⅞	82½	86	82⅜	86	82	86	82	85⅞	82½	86	82½	86
17—Tuesday	86⅝	88¾	83¾	88¼	86½	88¾	83⅝	88¾	86½	88⅝	83¾	88¼	86½	88¾	83⅝	88⅜
18—Wednesday	88⅛	89½	87⅛	87⅜	88¾	89½	87⅜	87½	88	89½	87⅛	87½	88¾	89½	87⅛	87⅝
19—Thursday	86¾	87¾	85¼	86⅜	87¼	87⅞	85⅜	86¼	87¼	87⅞	85½	86½	87¼	87⅞	85⅜	86¼
20—Friday	86½	86½	83⅞	84⅛	86¼	86½	84	84¼	86¼	86⅝	83¾	84⅛	86¼	86½	84	84¼
21—Saturday	83⅞	87	83⅝	87	83¾	86⅞	83¾	86¾	84	87	83⅞	86⅞	83¾	86⅞	83¾	86¾
23—Monday	87¼	88⅛	85½	85¾	87	88⅜	85½	86	87	88¼	85½	86	87	88⅜	85½	86
24—Tuesday	85⅝	86½	83⅞	84⅜	86	86⅝	83¾	84¼	86⅛	86⅝	83⅞	84¾	85⅞	86⅝	83¾	84½
25—Wednesday	84¼	86⅝	83	86⅜	84⅜	86⅝	83	86½	84½	86⅝	82⅞	86⅜	84¼	86⅝	83	86½
26—Thursday	86½	86½	84⅜	85	86¼	86½	84¼	85	86¾	86¾	84⅜	85	86¼	86½	84¼	85
27—Friday	85¼	86	84⅛	85¾	85½	85⅞	84	85⅞	85¼	85⅞	84	86¾	85½	85⅞	84	85⅞
28—Saturday	85¾	85¾	84¼	85⅛	86	86	84	85	86	86	84¼	84⅞	86	86	84¼	85
30—Monday	85½	87½	85½	87	85	87½	85	86⅞	85¾	87½	85½	86¾	85	87½	85	86⅞

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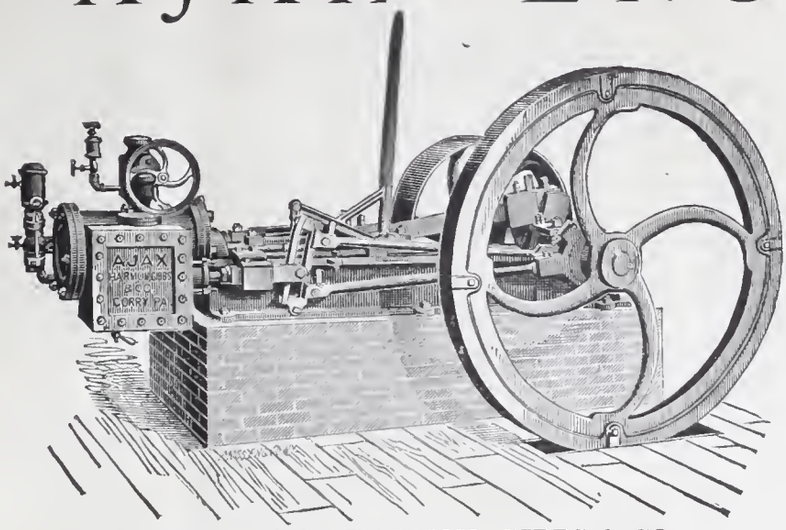

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In effect Oct. 24, 1887. Central time. One hour slower than Eastern time.

NORTHERN DIVISION.

SOUTHBOUND TRAINS.

STATIONS.	No. 7.	No. 23.	No. 25.	No. 17.	No. 19.
	A M	A M	A M	A M	P M
Bradford Lv	.....	.....	.....	7 30	.....
Mt. Jewett.....	.....	.....	.....	9 15	.....
Kane....	.....	.....	.....	10 10	.....
Sheffield Junc...	.....	.....	.....	11 04	.....
				P M	
Marienville	.....	.....	.....	12 12	.....
Tylersburg	.....	.....	.....	12 55	.....
Clarion Junction	.....	.....	6 20	1 45	4 00
Clarion	.....	.....	5 50	12 35	3 30
Shippenville	.....	.....	6 30	1 58	4 14
Knox....	.....	.....	6 45	2 14	4 33
St. Petersburg..	.....	.....	7 24	3 04	5 20
Foxburg.....	.....	5 40	7 38	3 25	5 40
Parker....	.....	5 50	7 48	3 36	.....
Bruin.....	.....	6 08	8 06	3 59	.....
Petrolia	.....	6 18	8 17	4 10	▬▬
Karns....	.....	6 22	8 22	4 17	9
Millerstown.....	.....	6 36	8 36	4 32	▬▬
St. Joe.....	.....	6 50	8 50	4 45	P M
Butler..... ...	5 15	7 18	9 30	5 20	1 50
Renfrew.....	5 28	7 39	9 46	5 38	2 13
Callery Junction	5 50	8 05	10 10	6 00	2 35
Allegheny.... Ar	7 10	9 33	11 25	7 23	4 00

NORTHBOUND TRAINS.

STATIONS.	No. 34.	No. 8.	No. 18.	No. 24.	No. 26.
	P M	A M	A M	P M	P M
Allegheny ... Lv	5 40	9 20	7 20	1 40	4 40
Callery Junction	7 30	10 50	8 40	3 00	6 10
Renfrew.....	8 02	11 12	9 00	3 21	6 33
Butler	8 30	11 30	9 21	3 50	7 05
St. Joe.....	.....	.....	9 50	4 15	7 38
Millerstown.....	.....	.....	10 06	4 32	7 53
Karns....	.....	▬▬	10 20	4 45	8 06
Petrolia....	.....	20	10 24	4 50	8 10
Bruin.....	.....	▬▬	10 35	5 00	8 22
Parker....	.....	A M	10 52	5 18	8 39
Foxburg.....	.....	6 27	11 25	5 45	8 50
St. Petersburg ..	.....	6 44	11 41	6 00	.....
			P M		
Knox....	.....	7 49	12 32	6 45	.....
Shippenville	.....	8 11	12 53	7 02	.....
Clarion Junction	.....	8 30	1 14	7 15	.....
Clarion....	.....	9 00	2 15	7 45	.....
Tylersburg....	.....	.....	1 48	.....	.....
Marienville....	.....	.....	2 26	.....	.....
Sheffield Junc...	.....	.....	3 06	.....	.....
Kane.... .....Ar	.....	.....	3 58	.....	.....
Mt. Jewett.....	.....	.....	4 40	.....	.....
Bradford.....	.....	.....	6 35	.....	.....

No. 4 leaves Allegheny at 6 a m; Callery Junction, 7:30; Renfrew, 7:15; arrives at Butler 8:10 a m.

No. 29 leaves Butler 11:45 a m; Renfrew, 12:06; arrives at Callery Junction 12:25; Allegany, 1:55 p m.

Westbound train leaves Callery Junction as follows:

Cleveland and Toledo express 8:35 a m; New Castle accommodation 3:05 p m; Chicago express, with through sleeping car, 1:44 p m; Zelienople accommodation 6:10 p m.

Sunday trains, Nos 23, 26 and 29, run daily. On Sundays No. 24 will run 25 minutes late and connect at Callery Junction for New Castle. No. 29 one hour late and connect at Callery Junction with Chicago express.

Nos. 7 and 17 will run daily between Butler and Allegheny.

No. 50, Sundays only. Leaves Allegheny at 12:40 p m; Callery Junction, 1;50 p m; arrives at Renfrew 2:14; Butler, 2:35.

C. W. BASSETT.
General Passenger Agent.

Dunkirk, Allegheny Valley & Pittsburg.

Going North.	No. 2.	No. 4.	No. 6.
	A M	P M	A M
Titusville Lv	7 35	3 20	7 35
Grand Valley..... ...."	8 03	3 48	8 01
Irvineton ...."	8 45	4 36	8 44
Warren.... ....."	8 58	4 53	8 56
Junction.... ....."	9 55	5 45	9 48
Lilly Dale.... ....."	10 50	6 36	10 37
Dunkirk.... .....Ar	11 25	7 10	11 12

Going South.	No. 1.	No. 3.	No. 5.
	A M	P M	P M
Dunkirk.....Lv	9 25	4 00	2 40
Lilly Dale..... ....."	10 03	4 38	3 14
Junction..... ....."	11 02	5 45	4 08
Warren.... ....."	11 55	6 44	5 06
	P M		
Irvineton....."	12 10	7 00	5 22
Grand Valley....."	12 58	7 49	6 12
Titusville,... ....Ar	1 20	8 15	6 40

Bradford, Bordell & Kinzua R. R

—AND—

Bradford, Eldred & Cuba R. R.

In effect Jan. 30, 1888.

Westward.				Eastward.		
.....	p m	a m	Ar Lv	a m	p m	.....
.....	5 15	11 50	....Bradford.. .	7 25	2 25	.....
.....	4 40	11 15	Kinzua Junct n	8 05	3 05	.....
. ...	4 33	11 08	....Rew City....	8 13	3 12	.....
.....	4 13	10 48	.....Rixford	8 31	3 28	.....
a m	4 08	10 43	..Duke Centre..	8 36	3 33	a m
10 10	3 50	10 25	....Eldred.....	8 55	3 50	1 25
9 45	3 32	10 10	..Bullis Mills.	9 10	4 05	1 45
9 26	3 17	9 54	.....Ceres.....	9 26	4 21	2 10
8 55	3 04	9 40	.Little Genesee.	9 40	4 35	2 35
8 40	2 55	9 30	....Bolivar.....	9 50	4 45	2 55
7 50	2 28	9 03	...Allentown....	10 15	5 12	3 35
7 00	1 55	8 30	lv. Wellsville. ar	10 50	5 45	4 15
a m	p m	a m		a m	p m	p m
	29	3	N.Y. L. E. & W.	8	22	
... .	10 45	2 37	..Hornellsville..	12 12	8 35	.....
.....	8 48	11 58	.... .Elmira.....	1 50	10 10	. ...
.....	6 55	11 28	. .Binghamton..	3 33	12 44	.....
			Lv Ar			
.....	11 30	5 00	...New York...	10 37	7 57	.....
	p m	p m		p m	a m	
p m	p m	a m		a m		p m
7 40	... .	10 35	ar..Bradford. lv	8 20	.....	5 25
7 05	.....	10 00	Kinzua Junct'n	9 00	.....	6 05
6 59	10 02	9 54	.....Aiken.	9 06	.....	6 11
6 53	.....	9 48	.....Davis.....	9 12	9 23	6 17
6 47	9 50	9 42	.....Simpson....	9 18	.....	6 23
6 35	.....	9 30	. ..Ormsby	9 30	.....	6 35
6 00	9 05	8 55	. .Smethport...	10 05	10 15	7 10
6 00	.....	8 55	...Mt. Jewett...	10 05	.....	7 10
5 15	.....	8 10	... ..Kane ...ar	10 50	.....	7 55
p m	a m	a m		a m		

PITTSBURG & WESTERN.

1 04	.....	.....	.....Clarion.....	1 40	.....	.....
12 32	.....	.....	....Foxburg	3 25	.....	.....
10 50	. ...	.....	.....Parker.....	3 36	.....	.....
.....	.....	.....	.....Petrolia	3 45	....	.....
9 21	.....	.....	. ... Butler.....	5 20	.....	.....
			Lv Ar			
7 20	a m	.....	... Allegheny...	7 20	p m	.....

No Sunday Trains.

JNO. C. McKENNA,
Supt. and Gen. Pass. Agt.

PHILADELPHIA & ERIE RAILROAD.

Time table in effect Nov. 15, 1886. Eastern standard time.

Eastward.	No. 18.	No. 8.	No. 4.	No. 12.
	A M	A M	P M	P M
Erie.....Lv	7 35	.....	2 45	5 25
Corry.... ...."	9 00	.....	4 13	6 55
Irvineton..... ....."	9 50	.....	5 00	7 50
Warren.. ......"	10 05	.....	5 15	8 05
Kane.....Ar	11 25	. ....	6 30	9 15
Kane.... Lv	.....	6 25	6 55	.....
Johnsonburg ....."	.....	6 58	7 30	.....
Emporium Junction.."	.....	8 30	9 15	.....
Lock Haven..... ...."	.....	11 15	11 58	.....
		P M	A M	
Williamsport. ....."	.....	12 20	1 25	....
Harrisburg.....Ar	.....	3 13	4 30	.....
Philadelphia....."	.....	6 50	8 25	.....

Westward.	No. 11.	No. 3.	No. 11.	No, 17.
	A M	P M	A M	P M
Philadelphia.....Lv	.....	11 25	7 40	.....
		A M		
Harrisburg.... ... ..."	.....	3 30	11 25	.....
			P M	
Williamsport..... ..."	.....	7 10	2 25	.....
Lock Haven ....."	.....	7 58	3 15	.....
Emporium Junction.."	.....	10 30	6 25	.....
Johnsonburg....."	.....	12 00	8 02	....
		P M		
Kane.... .....Ar	.....	12 40	8 35	.....
Kane.... Lv	6 35	1 00	.....	4 10
Warren..... ....."	7 45	1 58	.....	5 25
Irvineton....."	7 58	2 09	.....	5 46
Corry......"	8 55	2 56	.....	6 45
Erie.....Ar	10 10	4 00	. ....	8 05

Trains daily except Sunday.

Through-car arrangement westward—Erie mail—Pullman palace sleeping cars Philadelphia to Erie, and Philadelphia to Williamsport (cars open to receive passengers at Philadelphia at 10 p m), and Washington to Williamsport. Passenger coaches from Philadelphia to Erie, and Baltimore to Williamsport.

Niagara express—Pullman parlor car Philapelphia to Williamsport.

Through-car arrangement eastward—day express—Pullman parlor car Williamsport to Philadelphia. Passenger coaches Kane to Philadelphia, and from Williamsport to Baltimore.

Erie mail—Pullman sleeper Erie to Philadelphia, and Williamsport to Philadelphia (car open to receive passengers at Williamsport at 9 p m). Passenger coaches Erie to Philadelphia, and Williamsport to Baltimore. Sleeping car Williamsport to Washington.

Wheeling & Lake Erie R. R.

Time table in effect Jan. 1888. Central standard time.

Eastward.	No. 5.	No. 7.	No. 9.*	No. 1.*
	A M	P M	P M	A M
Toledo.....Lv	7 45	1 10	4 50	.....
Oak Harbor..... Ar	8 41	2 05	5 45	.....
Fremont	9 06	2 30	6 10	.....
Clyde	9 22	2 47	6 25	.....
Bellevue.....	9 37	3 03	6 40	.....
Monroeville.... Lv	9 55	3 20	6 58	3 10
Norwalk....	10 10	3 38	7 15	3 22
Wellington	11 00	4 32	8 08	4 00
Creston....	11 53	5 20	9 05	4 47
	P M			
Orrville.... ... .Ar	12 20	5 48	9 40	*5 15
			A M	
Orrville.....Lv	12 40	5 53	7 05	7 05
Massillon..... ..... { Ar	1 20	6 35	7 52	7 52
Massillon..... ..... { Lv	1 20	6 35	7 52	7 52
Navarre.....	1 35	6 50	8 10	8 10
Valley Junction....Lv	2 15	7 40	8 55	8 55
New Cumberland.....	2 28	7 53	9 10	9 10
Sherrodsville....	2 40	8 05	9 25	9 25
Leeesville.....	2 48	8 13	9 40	9 40
Bowerston.. .....Ar	2 55	8 20	9 50	9 50
Canal Dover.	2 57	6 05	.....	.....
		A M	.....	.....
New Comerstown.....	3 38	6 45	.....	.....
Cambridge.....	4 38	7 45	.....	.....
Macksburg....	6 09	9 15	.....	.....
Marietta... ....Ar	7 25	10 25	.....	.....

Westward.	No. 5.	No. 8.	No. 4	No. 2.
	A M	P M	A M	
Marrietta.... Lv	6 00	12 10	.....	.....
Macksburg....	7 15	1 24	.....	.....
Cambridge.....	8 57	3 00	.....	.....
New Comerstown	10 00	4 00	.....	.....
Canal Dover.....	10 42	4 40	.... :	.....
Bowerston.....	11 25	3 45	5 55	.....
Lecsville	11 32	3 55	6 02	.....
Sherrodsville	11 40	4 10	6 10	.....
New Cumberland	11 52	4 25	6 22	.....
	P M			
Valley Junction.....	12 20	5 02	6 45	.....
Navarre.....	12 50	5 35	7 35	. ....
Massillon....	1 05	5 50	8 00	.....
Orrville..... ..... { Ar	1 40	6 25	8 55	.....
Orrville..... ..... { Lv	1 45	*6 35	9 13	.....
Creston....	2 18	7 02	9 42	.....
Wellington....	3 05	7 43	10 33	A M
Norwalk....	3 55	8 25	11 25	7 25
Monroeville.....	4 07	8 35	11 37	7 35
Bellevue....	4 23	9 15	11 55	7 51
			P M	
Clyde.....	4 39	9 29	12 10	8 06
Fremont....	4 55	9 45	12 28	8 23
Oak Harbor.....	5 20	.....	12 53	8 45
Toledo.... .....Ar	6 20	*10 45	1 50	9 40

HURON DIVISION.

Northward.	No. 25.	No. 27.		
	A M	P M		
Monroeville.....Lv	.....	.....	.....	.....
Norwalk..... ..... { Ar	.....	.....	.....	.....
Norwalk..... ..... { Lv	7 00	3 55	.....	.....
Milan.... .....Ar	7 25	4 20	.....	.....
Friese Landing.....	7 37	4 32	.....	.....
Huron	7 55	4 50	.....	.....

Southward.	No. 26.	No. 28.		
	A M	P M		
Huron Lv	9 10	5 30	.....	.....
Friese Landing.....	9 25	5 45	.....	.....
Milan....	9 45	6 03	.....	.....
Norwalk..... ..... { Ar	10 20	6 30	..	.....
Norwalk..... ..... { Lv	.....	.....	.....	.....
Monroeville.....Ar	.....	.....	.....	.....

*Daily.

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M. D. WOODFORD,
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W. & W. R. R. Time Table.

N.-J. T'W'D. 3	N.-J. T'W'D. 1		STATIONS.		SOUTHW'D 2	SOUTHW'D 4
2 00	6 10	Lv..	Waynesburg	Ar	10 35	6 25
2 15	6 15	.....	Sycamore	.....	10 17	6 07
2 23	6 23	.....	Swart	.....	10 09	5 59
2 30	6 30	.....	Deer Lick	.....	10 02	5 52
2 38	6 38	.....	West Union	.....	9 53	5 43
2 47	6 47	.....	Dunn	.....	9 43	5 33
2 50	6 50	.....	Lindley's Mills	.....	9 40	5 30
3 01	7 02	.....	West Amity	.....	9 28	5 18
3 06	7 08	.....	Luellen	.....	9 22	5 12
3 11	7 13	.....	Baker	.....	9 17	5 07
3 14	7 20	.....	McCracken	.....	9 13	5 00
3 27	7 35	.....	Vankirk	.....	9 00	4 47
3 40	7 50	.....	Braddock	.....	8 48	4 33
3 55	8 05	Ar..	Washington	..Lv	8 35	4 20
6 36	9 55	Ar....	Pittsburg	Lv	6 10	1 55
			P. C. & St. L. R. R.			

Time given above is Central Standard, which is 40 minutes slower than Pittsburg or local time, or one hour slower than Eastern time.

The Company reserve the right to vary from this schedule as circumstances may require. All trains daily except Sunday.

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Time table in effect April 1, 1888.

Eastward. 12 Buff Mail	10 Buff Ex.		STATIONS Buffalo Division.		Westward. 9 Br'd Ex.	11 Br'd Mail
p m	a m				a m	p m
3 30	7 45	Lv	Bradford	.....Ar	11 15	8 05
3 33	7 48	.....	Kendall	.....	11 12	8 02
3 41	7 56	.....	Limestone	.....	11 04	7 54
3 53	8 08	.....	Carrollton	.....	10 52	7 42
4 08	8 25	.....	Salamanca	.....	10 40	7 31
4 31	8 46	.....	Ellicottville	.....	10 14	7 04
4 40	8 55	.....	Ashford	.....	10 05	6 55
5 15	9 30	.....	Springville	.....	9 30	6 20
6 35	10 50	Ar.....	Buffalo	Lv	8 10	5 00
p m	a m				a m	p m

40	2 Ex.	4 Rch Mail	STATIONS. Rochester Div.		1 Mail	3+ Ex.	41
a m	a m	p m			p m	p m	p m
7 15	9 00	2 30	Lv Bradford	Ar	1 10	10 25	5 30
7 56	9 11	2 42	... Limestone	...	12 55	10 14	5 05
8 08	9 24	2 54	...Carrollton	...	12 41	10 02	4 55
.....	9 50	3 16	...Salamanca	...	12 28	9 49	.....
11 57	10 13	3 40	.. Ellicottville	..	11 57	9 23	1 15
.....	11 41	5 11	...Gainesville	...	10 25	8 00	.....
.....	12 03	5 36	.....Warsaw	....	10 02	7 35	.....
.....	12 53	6 20	.....LeRoy	....	9 22	6 40	.....
.....	1 45	7 15	ArRochester	Lv	8 30	5 40	.....
.....	p m	p m			a m	p m	p m

45	1 Mail	STATIONS. Pittsburg Division.			4 Mail	44
a m	p m				p m	p m
6 25	1 30	Lv	Bradford	.....Ar	2 15	4 40
12 20	4 00	.....	Ridgeway	.....	11 38	11 10
3 50	5 25	.....	Falls Creek	.....	10 10	7 00
4 00	5 30	.....	Du Bois	.....	10 00	6 15
.....	6 29	Ar...	Punxsutawney	Lv	9 00	.....
p m	p m				a m	a m

Connections for East and West are made at Rochester with New York Central & West Shore R. R., and at Salamanca with the N. Y., P. & O. R. R. for Jamestown, Mansfield, Cincinnati, Chicago and the West, at Ridgway with the Philadelphia & Erie R. R. for Emporium, Williamsport, Philadelphia and Baltimore, at Falls Creek with the Allegheny Valley Railroad for Brookville, Reynoldsville and Stations on the Low Grade Division.

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(90th Meridian.)

NORTHW'D. 6	NORTHW'D. 2	STATIONS.	SOUTHW'D. 1	SOUTHW'D. 5
P. M.	A. M.		A. M.	P. M.
8 00	10 40	Ar....Greenville...Dp	6 07	3 20
7 55	10 30	.....Shenango.....	6 17	3 33
7 45	10 17	.....Kremis.....	6 29	3 44
7 31	10 08	.....Fredonia.....	6 37	3 52
7 22	10 02	..... Coolspring	6 42	3 56
7 23	10 01	.....Kerby Siding.....	6 43	3 57
7 12	9 50	..... Mercer	6 57	4 08
7 02	9 40	..... Pardoe	7 07	4 17
6 57	9 36	..... Filer.....	7 11	4 22
6 49	9 29	..... Grove City	7 19	4 28
6 46	9 26	..... Reed.....	7 20	4 30
6 35	9 16	.....Harrisville.....	7 33	4 41
6 30	9 12	..... Wick	7 37	4 45
6 25	9 07	.....Branchton.....	7 42	4 50
6 22	9 05	..Coaltown Junction..	7 44	4 52
6 19	9 03	.....Keisters.....	7 47	4 55
6 11	8 56	.....Hallston.....	7 56	5 02
6 03	8 46	.....Euclid.....	8 07	5 11
5 53	8 37	..... Jamisonville	8 17	5 19
5 45	8 30	..... Oneida	8 30	5 25
5 35	8 20	..P. &. W. Junction..	8 40	5 35
5 25	8 15	Dp..... Butler.....Ar	8 43	5 37
		Pittsburg & Western.		
3 30	6 00	..... Allegheny.....	10 30	7 35
P. M.	A. M.		A. M.	P. M.

HILLIARD BRANCH.

10	12	STATIONS.	9	11
A. M.	A. M.		A. M.	P. M.
12 00	7 30	Ar...Branchton....Dp	9 10	6 30
11 50	7 20	..... Bovaird.....	9 20	6 35
11 30	6 56	.....Annandale.....	9 40	7 00
11 20	6 48	.....Roy.....	9 50	7 10
11 00	6 40	Dp ...Hilliard.....Ar	10 00	7 20

Trains 4 and 5 run daily with through coach service between Allegheny, Chautauqua Lake and Jamestown, N. Y. All other trains daily except Sunday.

I. D. STINSON, G. P. A., Greenville, Pa. J. T. Gen. Man., Greenville, Pa.

Western New York & Pennsylvania R. R.

(Formerly B., N. Y. & P. R. R.)

Time table in effect Dec. 4, 1887. Eastern time (75th Meridian.)

Train will leave Bradford for

GILLMOR, KNAPP'S CREEK AND OLEAN

Olean express..... 7:15 a. m.
Buffalo mail ..... 2:15 p. m.
Olean express..... 4:15 p. m.
Sunday train..... 9:15 a. m.

FOR DALLAS, RIXFORD AND ELDRED.

Eldred express..... 8:30 a. m.
Eldred accommodation ..... 1:40 p. m.
Eldred express..... 5:15 p. m.

Train leaving Bradford at 5:15 p. m. for Eldred makes direct connections for Williamsport, Harrisburg, Philadelphia and points East.

"Bradford Short Line"

FOR SONG BIRD, MARSHBURG, KINZUA, OIL CITY AND PITTSBURG.

Kinzua accommodation..... 6:30 a. m.
Pittsburg express..... 9:15 a. m.
Oil City express..... 4:20 p. m.

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GEO. S. GATCHELL, Gen'l Supt.
J. A. FELLOWS, Gen'l Pass. and Ticket Agent, 84 Exchange street, Buffalo, N. Y.

Maps of Saxonburg.

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